

REPAIR MANUAL 2005

BEDIENUNGSANLEITUNGEN

OWNER'S MANUAL
MANUALE O'USO
MANUEL D'UTILISATION
MANUAL DE INSTRUCCIONES



REPARATURANLEITUNG

REPAIR MANUAL
MANUALE DI REPARAZIONE
MANUEL DE REPARATION
MANUAL DE REPARACION



FEDERBEIN

SHOCK ABSORBER
AMMORTIZZATORE
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OWNER'S MANUAL 2005

250 EXC RACING
400 EXC RACING
450 SX, MXC, EXC RACING
525 SX, MXC, EXC RACING

OWNER'S MANUAL
MANUALE D'USO
MANUEL D'UTILISATION
MANUAL DE INSTRUCCIONES

ART. NR. 3.211.39



We would like to congratulate you on your purchase of a KTM motorcycle.

You are now the owner of a state-of-the-art sport motorcycle that guarantees to bring you lots of fun and enjoyment, provided that you clean and maintain it appropriately. **Before you go for your first ride, be sure to read this manual carefully and thoroughly in order to familiarize yourself with how to operate your new motorcycle and with its characteristics, even if this means that you will have to dedicate some of your valuable time to this task. Only by doing so will you learn how to tune your motorcycle to your specific needs and how to protect yourself against injury. Besides, this manual contains important information on motorcycle maintenance.** At the time this manual was typeset, it was up-to-date with the latest state of this production series. It cannot be completely ruled out, however, that minor discrepancies may exist resulting from further design upgrades of these motorcycles. This manual is an important part of your motorcycle and should be passed on to any subsequent owner in case you decide to sell it.

We expressly point out that work marked with an asterisk in the chapter "Maintenance work on the chassis and engine" must be performed. If maintenance work should become necessary during a competition it should be performed by a trained mechanic. KTM strongly recommends that all service work to your KTM should be performed by a qualified KTM dealer.

For your own safety, use KTM-approved parts and accessories only. KTM is not liable for damage that arises in connection with the use of other products.

Take special care to follow the recommended run in, inspection, and maintenance intervals. Heeding these guidelines will significantly increase the life of your motorcycle. To ensure that all work to your KTM is performed properly and to avoid warranty conflicts, KTM recommends that you always have your KTM serviced by a recognized and qualified KTM dealer.

Off-road motorcycle driving is a wonderful sport and we hope that you will be able to enjoy it to the full. It may, however, involve potential problems for the environment or lead to conflicts with others. These problems or conflicts can be avoided if the motorcycle is used responsibly. To safeguard the future of motorcycle sports, make sure that you use the motorcycle in accordance with the law, show that you are environmentally conscious and respect the rights of others.

We wish you a lot of fun when driving !

KTM-SPORTMOTORCYCLE AG
5230 MATTIGHOFEN, AUSTRIA

Attachments: 1 spare parts manual chassis & engine

KTM sports motorcycles are designed and constructed to resist the usual wear and tear of normal use in competitions.

The motorcycles comply with the regulations and categories currently in effect with the leading international motorcycle associations.

Observance of the service, maintenance and tuning instructions for the engine and chassis specified in the Owner's Manual is a prerequisite for faultless operation and the avoidance of premature wear. An improperly tuned chassis can lead to damage and breakage of the chassis components (see chapter on checking the basic chassis setting).

The service work specified in the "Lubrication and Maintenance Schedule" must be performed and service records must be kept for warranty documentation. Lack of proper service and maintenance records or documentation could void warranty.

The fuels and lubricants specified in the Owner's Manual or fluids with equivalent specifications must be used in accordance with the maintenance schedule.

No claims can be filed under the warranty for damage or consequential damage caused by manipulations or conversions to the motorcycle.

The use of the motorcycle under extreme conditions, e.g. on extremely muddy and wet terrain, can lead to higher than average wear on components such as the drive train or the brakes. In this case it may become necessary to service or replace wear parts before the service limit specified in the maintenance schedule has been reached.

The SX/SXS, MXC and other "competition only" labeled models are prohibited on public roads.

"On the road" approved models are only allowed on public roads in the original homologated (throttled) version. **Without this performance restriction (i.e. de-throttled), these models are only allowed to be driven off-road and not on public roads.**

The EXC models are designed for off-road sports endurance competitions(enduro) and **not suitable for predominant motocross** use.

Note: The above is a general statement. Specific limited warranty and limited guarantee information may vary depending upon distribution. Please check with your local KTM dealer for limited warranty and limited guarantee information specific to your KTM model and region.



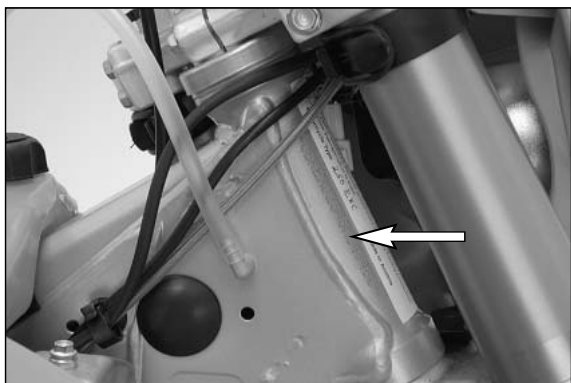
In accordance with the international quality management ISO 9001 standard, KTM uses quality assurance processes that lead to the highest possible product quality.

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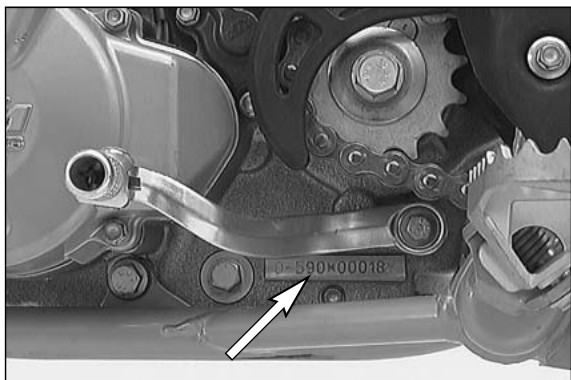
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SERIAL NUMBER LOCATIONS »



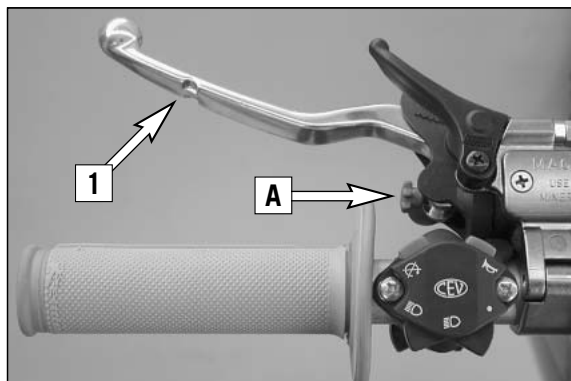
Chassis number

The chassis number is stamped on the right side of the steering head tube. Enter this number in the field on page no 1.



Engine number, engine type

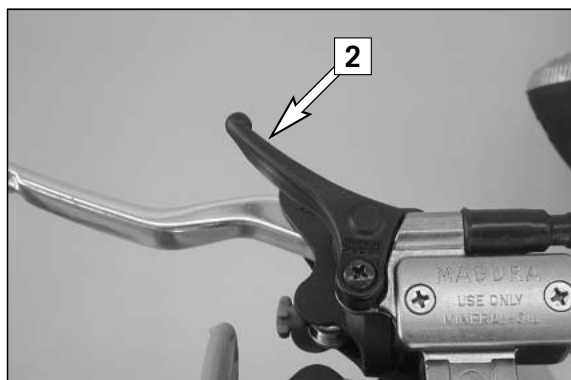
The engine number and the engine type are stamped into the left side of the engine below the engine sprocket. Enter this number on page 1.



Clutch lever

The clutch lever [1] is located on the left side of the handlebar. The adjusting screw [A] is used to change the original position of the clutch lever (see maintenance work on chassis and engine).

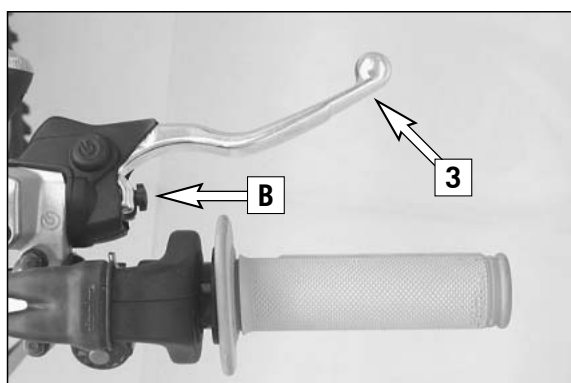
The clutch is hydraulically actuated and adjusts itself automatically.



Hand decompression lever

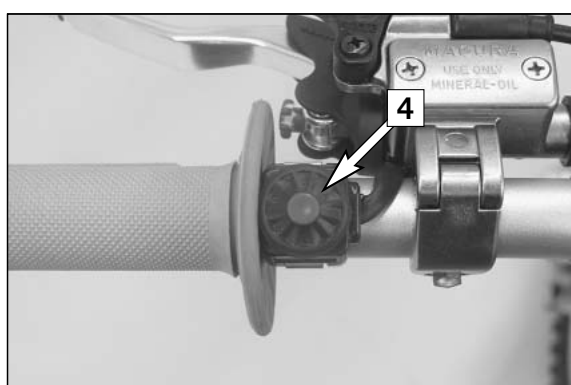
The hand decompression lever [2] is needed only if the carburetor overflows after a fall. To "pump the engine free", pull the hand decompression lever during the starting procedure.

The outer end of the lever must provide for a backlash of approx. 10mm (0.4 in) at all times. Only thereafter may it cause valve motion (to be recognized by the stronger resistance which the hand decompression lever encounters).



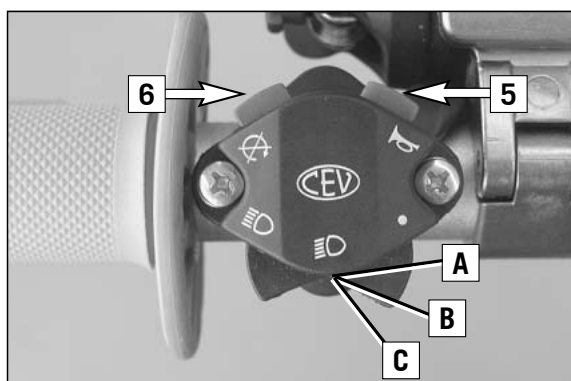
Hand brake lever

The hand brake lever [3] is mounted on the handlebars on the right and actuates the front wheel brake. The adjusting screw [B] can be used to change the basic position of the hand brake lever (see "Maintenance").



Short circuit button (SX/MXC)

The short circuit button [4] turns off the engine. When pressing this button, the ignition circuit is short-circuited.



Combination switch (EXC)

The light switch has 2, respectively 3 switch positions.

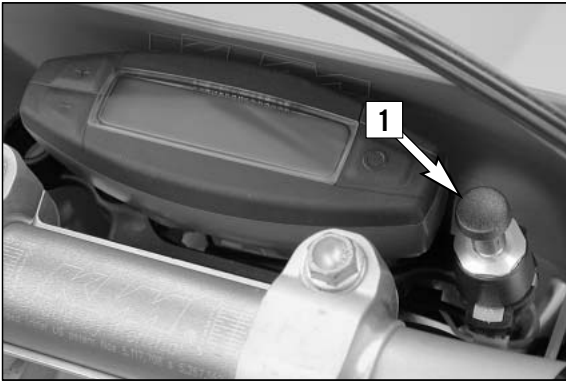
[A] = Light off (this function is not available in all models)

[B] = Low beam on

[C] = High beam on

You may use button [5] to actuate the horn.

The red short circuit button [6] serves to switch off the engine. Leave the switch pressed until the engine stops.



Headlamp switch (EXC USA)

In this model the headlamp is switched on with the pull switch [1].



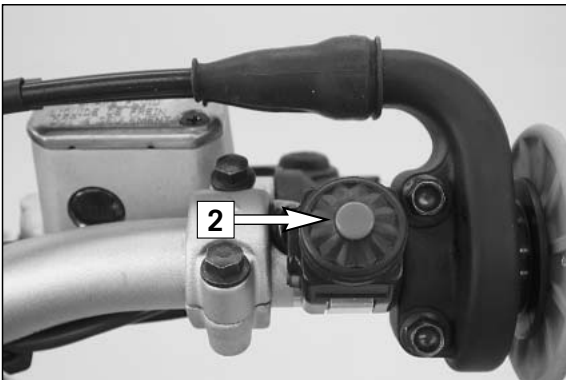
Flasher switch

The flasher switch is a separate unit and is mounted on the left portion of the handlebar.

The wire harness is designed in a way that whenever you want to use your bike off-road, you can dismount the entire turn indicator system without affecting the function of the remaining electrical system.

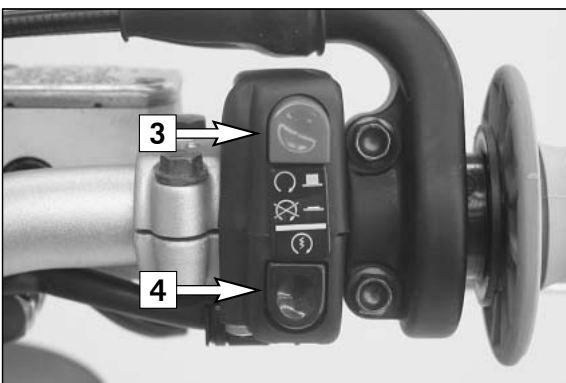
⇐ Flasher left

⇒ Flasher right



Starter button (EXC)

⚡ Pushing the black starter button [2] will actuate the E-starter.



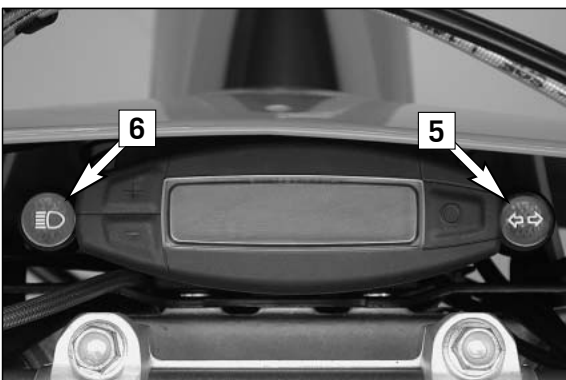
Emergency OFF switch (EXC Australia)

The red emergency-OFF switch [3] is arranged adjacent to the throttle grip.

⏻ In this position, the E-starter is operational and the engine can be started.

⊗ In this position, the E-starter and ignition circuits are interrupted. The E-starter cannot be actuated, and the engine will not start, not even if you attempt to start it with the kickstarter.

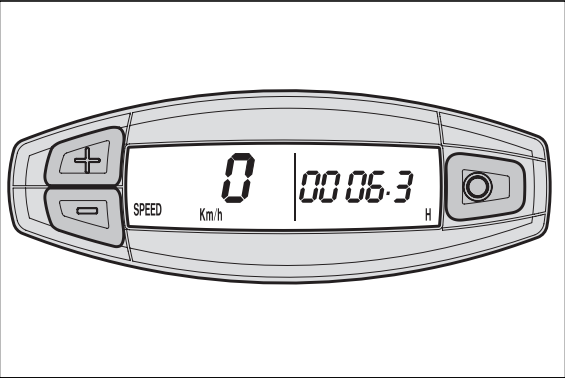
⚡ Pushing the black starter button [4] will actuate the E-starter.



Digital speedometer, indicator lamps

↔ The green control lamp [5] flashes in the same rhythm as the flashing indicator when the indicator is working.

ⓘ The blue control lamp [6] lights up when the high beam is on.



Electronic speedometer

The display in the electronic speedometer is activated as soon as you press a button on the speedometer or an impulse is received from the wheel sensor. The display lights up when the engine is running. The display is cleared if no button is pressed for 1 minute or no impulse is received from the wheel sensor. The **○** button is used to change between display modes. The **+** and **-** buttons are used to control various functions.

TEST

All of the display segments briefly light up for the display function test.



WS (wheel size)

The display changes and the circumference of the front wheel is briefly displayed in millimeters (2205 mm corresponds to a front wheel circumference of 21" with production tires). Afterwards the display will return to the previous display mode.



SPEED display mode / H (service hours)

Only the SPEED / H and SPEED / ODO display modes are activated in the condition at delivery. SPEED/H is displayed whenever the display is activated and the front wheel is not turning. It automatically changes to the SPEED/ODO display mode as soon as the front wheel starts turning.

SPEED displays the speed.

H displays the engine's service hours. The service hour counter starts to count as soon as you start the engine. The displayed figure cannot be changed. Service intervals are indicated in service hours for some KTM offroad motorcycles, making the service hour counter a very practical function.



SPEED / ODO display mode (odometer)

The SPEED/ODO mode displays the speed and the total distance traveled. The display automatically changes to the SPEED/H display mode when the front wheel stops turning.

- | | |
|-------------------------------|----------------------------------|
| + button | no function |
| - button | no function |
| briefly press ○ button | changes to the next display mode |
| hold ○ button 3 secs. | changes to the next display mode |

The electronic speedometer has a number of display modes (functions) that you can also activate (reveal) (see: Activating and deactivating display modes).



Activating and deactivating display modes

In the display mode SPEED/H, press and hold the **○** button for 3 seconds to access the SETUP menu. The active functions will be displayed. The blinking function can be activated by pressing the **+** button and deactivated by pressing the **-** button. Press and hold the **○** button 3 seconds to store the settings. If no button is pressed for 20 seconds, the setting will be stored automatically and the display will return to the SPEED/H mode.

- | | |
|-------------------------------|---|
| + button | activates the blinking display |
| - button | deactivates the blinking display |
| briefly press ○ button | changes to the next display without changing any settings |
| hold ○ button 3 secs. | starts the SETUP
stores the settings and changes to the SPEED/H mode |

The following display modes can be activated:

- | | |
|---------|---|
| TR1 | tripmaster 1 |
| TR2 | tripmaster 2 |
| A1 | average speed 1 |
| A2 | average speed 2 |
| S1 | stop watch 1 |
| S2 | stop watch 2 |
| CLK | clock |
| LAP | lap time |
| MAX | maximum speed |
| KMH/MPH | display in kilometers or miles (see: Kilometers or miles) |

If you have activated all of the display modes, they will be displayed in the following order:
SPEED/H, SPEED/CLK, SPEED/LAP, LAP/LAP, SPEED/MAX, SPEED/ODO, SPEED/TR1, SPEED/TR2, SPEED/A1, SPEED/A2, SPEED/S1, SPEED/S2



SPEED / CLK (time) display mode

CLK displays the time in hours, minutes and seconds.

- | | |
|-------------------------------|----------------------------------|
| + button | no function |
| - button | no function |
| briefly press ○ button | changes to the next display mode |
| hold ○ button 3 secs. | set the clock menu |

To set the clock, see „Setting the clock“.



SPEED / LAP (lap time) display mode

You can use the manual stop watch to stop and store up to 10 lap times, which you can view in the LAP/LAP display mode (see below). LAP displays the lap times in hours, minutes and seconds.

- | | |
|-------------------------------|---|
| + button | Starts and stops the stop watch, lap time is not reset to 0 |
| - button | Stops the stop watch, stores the lap time and restarts the stop watch again. The time is reset to 0. A total of 10 lap times can be stored. If the lap time continues to run after you press the - button, all 10 memory locations are occupied. To clear all of the stored lap times, hold the ○ button for 3 seconds in the SPEED/LAP mode. Up to 10 lap times can be stored in this way. |
| briefly press ○ button | Changes to the next display mode. If no lap time is stored or the motorcycle is driving, the LAP/LAP mode will be skipped. |
| hold ○ button 3 secs. | Clears all LAP figures |



LAP / LAP display mode (to view lap times)

The LAP/LAP display mode will only be shown if lap times have been stored and the front wheel has stopped. It will display the lap number and the stopped lap time in hours, minutes and seconds. Press the + button to access the next lap time.

To clear all of the stored lap times, hold the button for 3 seconds in the SPEED/LAP mode.

+ button	changes to the next lap time
- button	no function
briefly press button	changes to the next display mode
hold button 3 secs.	changes to the next display mode



SPEED / MAX display mode (maximum speed)

MAX displays the maximum speed traveled and is always active.

+ button	no function
- button	no function
briefly press button	changes to the next display mode
hold button 3 secs.	clears the MAX figure



SPEED / TR1 display mode (tripmaster 1)

The TR1 tripmaster is always active and counts to 999.9. It is used to measure the length of a trip or the distance between 2 refueling stops.

TR1 is linked to A1 (average speed 1). The calculation of these figures is activated by the first impulse received from the wheel sensor (when the front wheel starts to turn) and stops 3 seconds after the last impulse is received (when the front wheel has stopped).

The TR1, A1 and S1 figures are automatically cleared after passing 999.9.

+ button	no function
- button	no function
briefly press button	changes to the next display mode
hold button 3 secs.	clears the TR1, S1, A1 figures



SPEED / TR2 display mode (tripmaster 2)

The tripmaster 2 is always active and counts to 999.9. Contrary to TR1, the displayed figure can be changed using the + and - buttons. This is a very useful function for trips taken according to a roadbook.

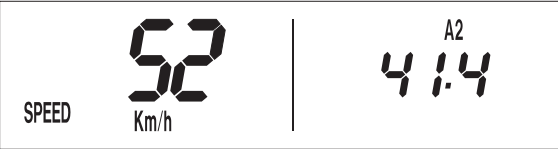
+ button	increases the TR2 figure
- button	decreases the TR2 figure
briefly press button	changes to the next display mode
hold button 3 secs.	clears the TR2 figure



SPEED / A1 display mode (average speed 1)



A1 shows the average speed based on the TR1 (tripmaster 1) and S1 (stop watch 1) figures. The calculation of this figure is activated by the first impulse received from the wheel sensor and stops 3 seconds after the last impulse is received.

+ button	no function
- button	no function
briefly press button	changes to the next display mode
hold button 3 secs.	clears the TR1, S1, A1 figures



SPEED / A2 display mode (average speed 2)



A2 shows the average speed based on the TR2 (tripmaster 2) and S2 (stop watch 2) figures.
The displayed figure can deviate from the actual average speed if the TR2 figure was changed manually or if S2 was not stopped after the trip.

- | | |
|--|----------------------------------|
| + button | no function |
| – button | no function |
| briefly press  button | changes to the next display mode |
| hold  button 3 secs. | changes to the next display mode |




SPEED / S1 display mode (stop watch 1)



S1 shows the traveling time based on TR1 and continues to run whenever it receives impulses from the wheel sensor. The calculation of this figure is activated by the first impulse received from the wheel sensor and stops 3 seconds after the last impulse is received.

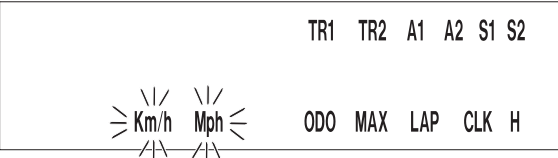
- | | |
|--|----------------------------------|
| + button | no function |
| – button | no function |
| briefly press  button | changes to the next display mode |
| hold  button 3 secs. | clears the TR1, S1, A1 figures |



SPEED / S2 display mode (stop watch 2)



S2 is a manual stop watch. Start the stop watch by pressing the + button, press again to hold. Press again to continue timing.
Press the  button to change to the next mode. The S2 display will blink in the other modes if S2 continues to run in the background. To stop S2, return to the SPEED/S2 mode and press the + button.


- | | |
|--|----------------------------------|
| + button | starts and stops the stop watch |
| – button | no function |
| briefly press  button | changes to the next display mode |
| hold  button 3 secs. | clears the S2 figure |





Kilometers or miles

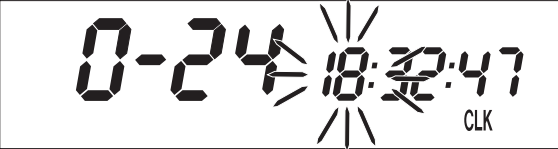
The unit (kilometers or miles) can also be changed. The ODO figure will be retained and converted accordingly. The TR1, A1, S1, TR2 and A2 figures will be cleared.

To select the unit, select the SPEED/H mode and hold the  button for 3 seconds to access the SETUP menu. Press the  button until the KMH/MPH function blinks. Press the + button briefly to move to the options. Press the + button for KMH or the – button for MPH.

To set, briefly press the  button 1 x and hold for 3 seconds until the display returns to the SPEED/H mode.

If no button is pressed for 20 seconds, the setting will be stored automatically and the display will return to the SPEED/H mode.

- | | |
|--|---|
| + button | to access the menu |
| | to activate the KMH display |
| – button | to activate the MPH display |
| briefly press  button | changes to the next mode |
| | changes from the menu to the SETUP menu |
| hold  button 3 secs. | stores and closes the SETUP menu |



Setting the clock

To set the clock, switch the ignition off and select the SPEED/CLK mode. Press and hold the button for 3 seconds. The blinking digits can be changed using the + and - buttons. Press the button to move to the next digit. 0-12 will show the time in the 12-hour mode, 0-24 in the 24-hour mode. Press and hold the button for 3 seconds to store the settings. If no button is pressed for 20 seconds, the settings will be stored automatically and the display will return to the SPEED/CLK mode.

- + button

- button

briefly press button

hold button 3 secs.
- time +

time -

changes to the next digit

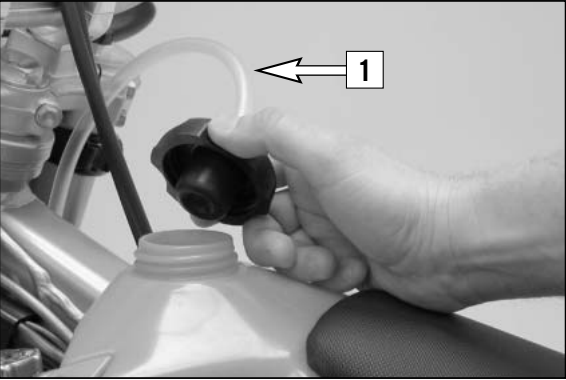
starts the SETUP menu

stores the time and changes to the SPEED/CLK display mode

Motorcycle is standing	Motorcycle is driving	OVERVIEW OF THE ELECTRONIC SPEEDOMETER FUNCTIONS				
		display	briefly press + button	briefly press – button	briefly press button	hold button 3 secs.
X		SPEED / H	no function	no function	next display mode	displays the SETUP menu
X	X	SPEED / CLK	no function	no function	next display mode	Setting the clock menu
X	X	SPEED / LAP	starts/stops LAP without clearing LAP figure	stops LAP, stores LAP figure, resets LAP to 0	next display mode	clears all LAP figures
X		LAP / LAP	next figure	no function	next display mode	next display mode
X	X	SPEED / MAX	no function	no function	next display mode	clears MAX
	X	SPEED / ODO	no function	no function	next display mode	next display mode
X	X	SPEED / TR1	no function	no function	next display mode	clears TR1, S1, A1
X	X	SPEED / TR2	increases the TR2 figure	reduces the TR2 figure	next display mode	clears TR2
X	X	SPEED / A1	no function	no function	next display mode	clears TR1, S1, A1
X	X	SPEED / A2	no function	no function	next display mode	next display mode
X	X	SPEED / S1	no function	no function	next display mode	clears TR1, S1, A1
X	X	SPEED / S2	starts - stops S2	no function	next display mode	clears S2

If the CLK, LAP, MAX, TR1, TR2 A1, A2, S1 and S2 figures are suddenly cleared, the battery in the electronic speedometer is empty and must be replaced (see: Replacing the battery in the electronic speedometer).

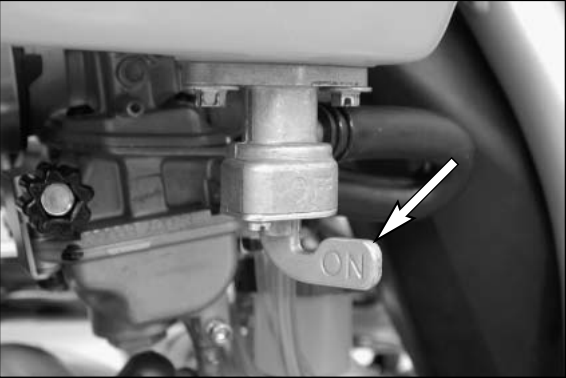
A tripmaster switch is available as an accessory that lets you control the electronic speedometer functions from the handlebar.



Filler cap

To open the filler cap: Turn the filler cap counter-clockwise.
To close the filler cap: Put the filler cap on and tighten it by turning it clockwise.

Install the tank breather hose [1] without kinks.

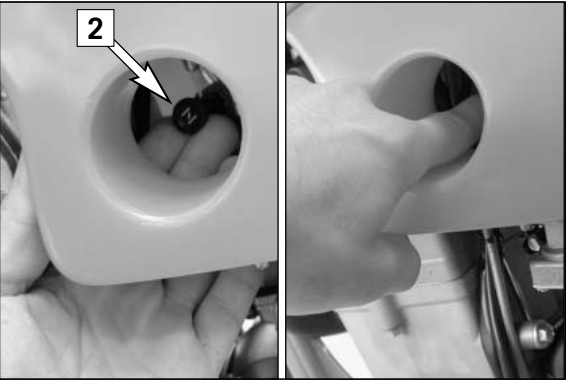


Fuel tap

OFF In this position the fuel tap is closed. No fuel can flow to the carburetor.
ON During operation the twist grip must be turned to ON. This means that the fuel can flow to the carburetor. With the twist grip in this position the tank will be emptied until only the reserve is left.
RES The reserve tank cannot be tapped until the rotating handle is turned to the RES position. Fill the tank as soon as possible and remember to turn the rotating handle back to the ON position so that you will have backup fuel next time, too.

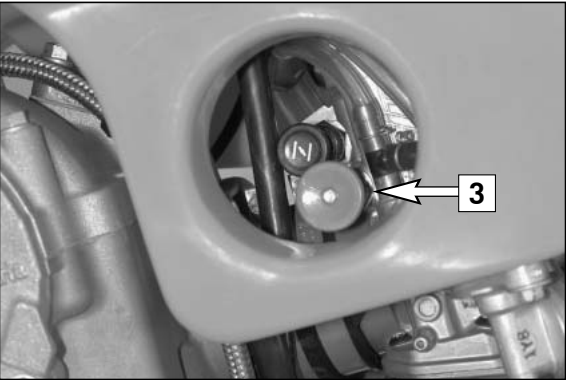
Reserve MXC3.0 l (0,8 US gallons)
Reserve EXC1.0 l (0,3 US gallons)

	OFF	ON	RES
SX			
MXC EXC			



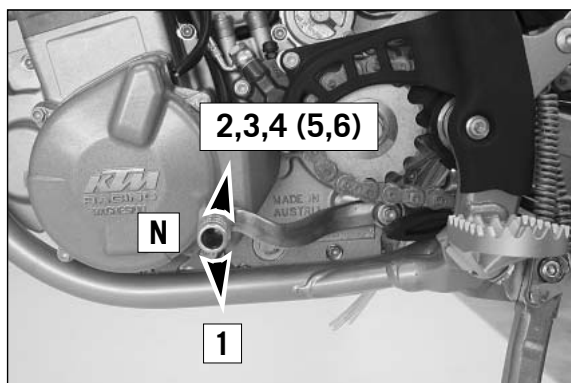
Choke

If you pull the choke button [2] out as far as possible, a bore in the carburetor will be opened through which the engine may take in additional fuel. The result is a „fat“ fuel-air mixture of the type needed for cold starts.
To deactivate the choke, push the choke button back into its basic position.



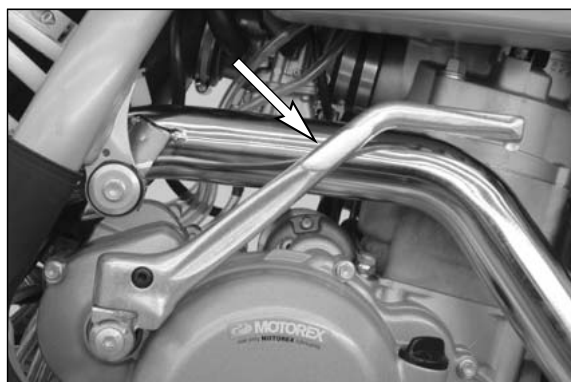
Hot start device (450/525 SX)

If you pull the hot start device [3] out as far as possible, a bore in the carburetor will be opened through which the engine may take in additional air. The result is a „lean“ fuel-air mixture of the type needed for hot starts.
To deactivate the hot start device, push the hot start button back into its basic position.



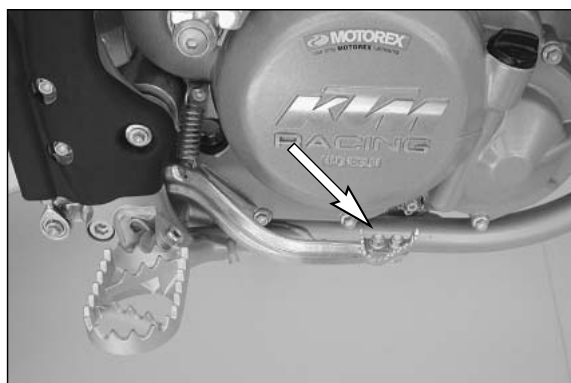
Shift lever

The shift lever is mounted on the left side of the engine. The position of the gears is shown in the illustration. Neutral, or the idle speed, is located between first and second gear.



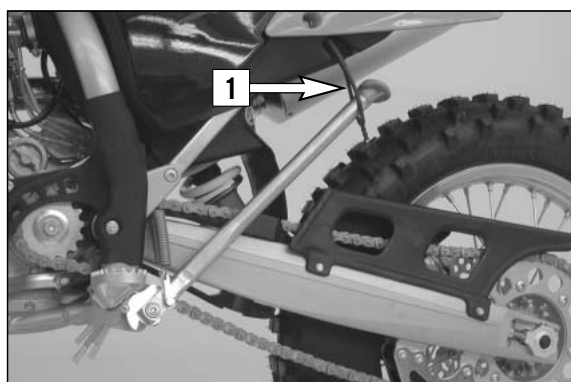
Kickstarter

The kickstarter is mounted on the right side of the engine. Its upper part can be swivelled.



Foot brake pedal

The foot brake pedal is located in front of the right footrest. Its basic position can be adjusted to your seat position (see maintenance work).



Side stand

Push the side stand to the ground with your foot and load it with the motorcycle. Make sure that you put your bike on solid ground and in a secure position. For off-road riding, you can use the rubber band [1] to additionally secure the center stand in its folded-up position

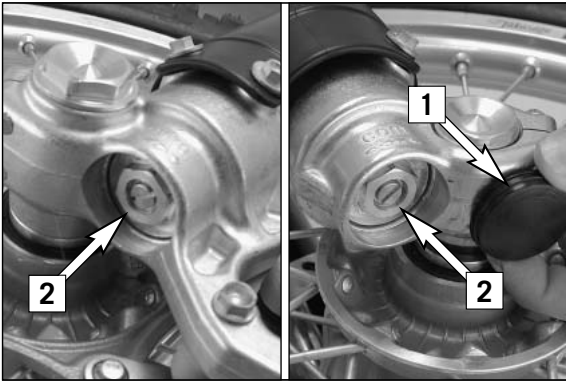


Steering lock

The handlebar can be locked by means of the lock located on the steering head. To lock it, turn handlebar all the way to the right, insert key, turn it to left, press it in, turn it to right, and remove it.

! CAUTION

NEVER LEAVE THE KEY INSERTED IN THE STEERING LOCK. IF YOU TURN THE HANDLEBAR TO THE LEFT THE KEY COULD GET DAMAGED.



Compression damping of fork

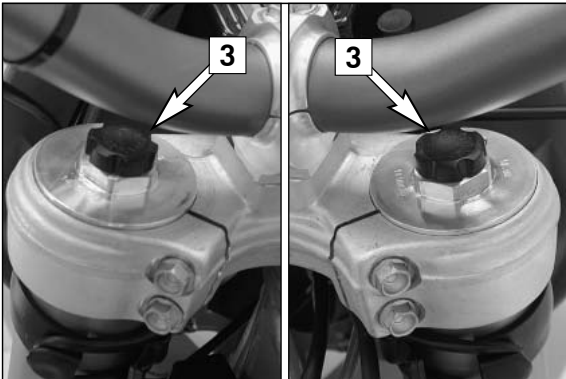
Hydraulic compression damping determines the reaction when the fork is compressed. The degree of compression can be adjusted with adjusting screws at the bottom of the fork legs. Remove the protecting cap [1]. Turn the adjusting screws [2] clockwise to increase damping, turn it counterclockwise to reduce damping during compression.

STANDARD ADJUSTMENT

- turn adjusting screw clockwise as far as it will go
- turn it back by as many clicks as are specified for the relevant type of fork

Typ White Power 14187A05.....22 clicks (SX)

Typ White Power 14187A06.....20 clicks (EXC/MXC)



Rebound damping of fork

Hydraulic rebound damping determines the reaction when the fork is rebound. By turning the adjusting screw [3] (REB), the degree of damping of the rebound can be adjusted. Turn the knob clockwise to increase damping, turn it counterclockwise to reduce damping during rebounding.

STANDARD ADJUSTMENT

- turn adjusting screw clockwise as far as it will go
- turn it back by as many clicks as are specified for the relevant type of fork

Typ White Power 14187A05.....20 clicks (SX)

Typ White Power 14187A06.....20 clicks (EXC/MXC)



Damping action during compression of shock absorber (SX)

The shock absorber on the SX models can synchronize the compression damping in the low and high-speed range separately (Dual Compression Control).

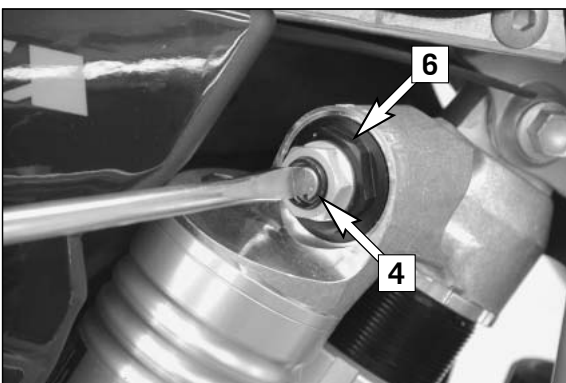
Low and high speed refers to the movement of the shock absorber during compression and not to the speed of the motorcycle.

The low and high-speed technology overlaps.

The low-speed setting is primarily for slow to normal shock absorber compression rates.

The high-speed setting is effective at fast compression rates.

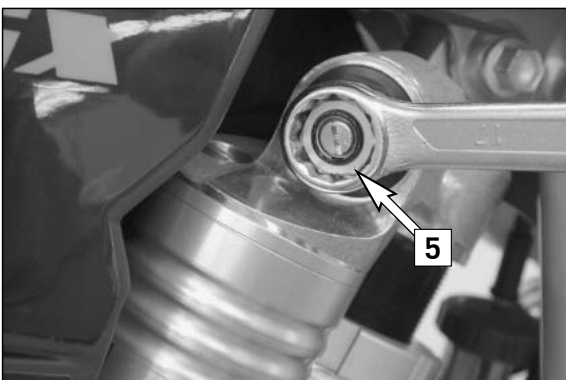
Turning in a clockwise direction will increase the damping, turning counterclockwise will decrease the damping.



STANDARD LOW-SPEED SETTING:

- turn the adjusting screw [4] to the limit in a clockwise direction using a screwdriver .
- unscrew the respective number of clicks for the specific type of shock absorber in a counterclockwise direction.

Typ White Power 12187A05.....15 clicks



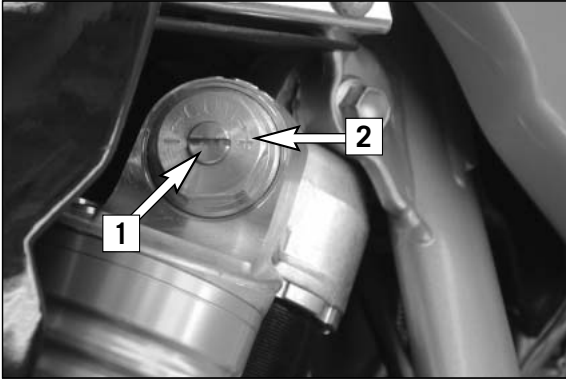
STANDARD HIGH-SPEED SETTING:

- turn the adjusting screw [5] to the limit in a clockwise direction using a box wrench.
- unscrew the respective number of turns for the specific type of shock absorber in a counterclockwise direction.

Typ White Power 12187A05.....2 turns

⚠ WARNING

THE DAMPING UNIT OF THE SHOCK ABSORBER IS FILLED WITH HIGH-COMPRESSION NITROGEN. NEVER TRY TO TAKE THE SHOCK ABSORBER APART OR TO DO ANY MAINTENANCE WORK YOURSELF. SEVERE INJURIES COULD BE THE RESULT. NEVER UNSCREW THE BLACK SCREW CONNECTION [6] (24MM).



Compression damping of shock absorber (MXC, EXC)

The compression damping (during compression) can be adjusted for the MXC and EXC shock absorbers (Mono Compression Control).

The degree of damping can be adjusted by turning adjusting screw [1] with a screwdriver. Turning in a clockwise direction will increase the damping, turning in a counterclockwise direction will decrease the damping.

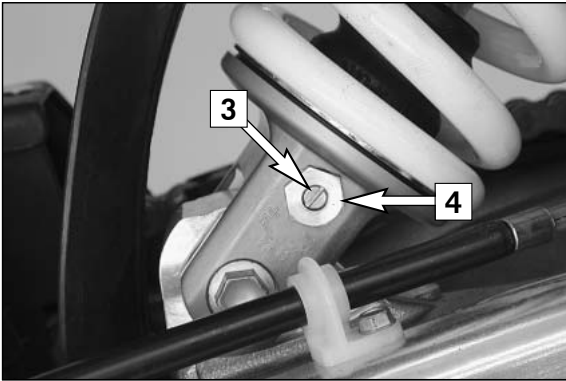
STANDARD ADJUSTMENT:

- turn the adjusting screw clockwise to the stop.
- then turn the adjusting screw counterclockwise, counting the number of clicks that corresponds to the respective type of shock absorber.

Type White Power 12187A0615 clicks

⚠ WARNING

THE DAMPING UNIT OF THE SHOCK ABSORBER IS FILLED WITH HIGH-COMPRESSION NITROGEN. NEVER TRY TO TAKE THE SHOCK ABSORBER APART OR TO DO ANY MAINTENANCE WORK YOURSELF. SEVERE INJURIES COULD BE THE RESULT. NEVER UNSCREW THE BLACK SCREW CONNECTION [2] (24MM).



Rebound damping of shock absorber (SX, MXC, EXC)

By using the adjusting screw [3], the degree of damping of the rebound can be adjusted. Turn the knob clockwise to increase damping, turn it counterclockwise to reduce damping during rebounding.

STANDARD ADJUSTMENT:

- turn the adjusting screw clockwise to the stop.
- then turn the adjusting screw counterclockwise, counting the number of clicks that corresponds to the respective type of shock absorber.

Type White Power 12187A0522 clicks

Type White Power 12187A0622 clicks

⚠ WARNING

THE DAMPING UNIT OF THE SHOCK ABSORBER IS FILLED WITH HIGH-COMPRESSION NITROGEN. NEVER TRY TO TAKE THE SHOCK ABSORBER APART OR TO DO ANY MAINTENANCE WORK YOURSELF. SEVERE INJURIES COULD BE THE RESULT. NEVER UNSCREW THE BLACK SCREW CONNECTION [4] (15MM).

Instructions for initial operation

- Verify that your KTM dealer performed the PREPARATION OF VEHICLE jobs (see Customer Service Manual).
- Read these operating instructions carefully before your first ride.
- Familiarize yourself with the operating elements.
- Set the clutch lever, the handbrake lever, and the footbrake pedal to the positions that are most convenient for you.
- Get used to handling the motorcycle on an empty parking lot or open space, before starting on a longer drive. Also try to drive as slowly as possible and in a standing position, to improve your feeling for the vehicle.
- Do not drive along off-road tracks which go beyond your ability and experience.
- Hold the handlebars with both hands and leave your feet on the foot rests while driving.
- Remove your foot from the foot brake lever when you are not braking. If the foot brake lever is not released the brake pads rub continuously and the braking system is overheated.
- Do not make any alterations to the motorcycle and always use ORIGINAL KTM SPARE PARTS. Spare parts from other manufacturers can impair the safety of the motorcycle.
- Motorcycles are sensitive to alterations in the distribution of weight. If you are taking luggage with you, this should be secured as close as possible to the middle of the vehicle; distribute the weight evenly between the front and rear wheel. Never exceed the maximum permissible laden weight and the axle weights. The maximum permissible laden weight is comprised of the following components:
 - Motorcycle ready for operation and tank full
 - Luggage
 - Driver with protective clothing and helmet.
- Pay attention to the running-in procedure.

Running in the Racing models

Even very precisely machined sections of engine components have rougher surfaces than components which have been sliding across one another for quite some time. Therefore, every engine needs to be broken in.

For this reason, do not load the engine more than 50% of its capacity during the first 3 operating hours. Besides, the engine speed must not exceed 7000 rpm. Avoid going full-throttle!

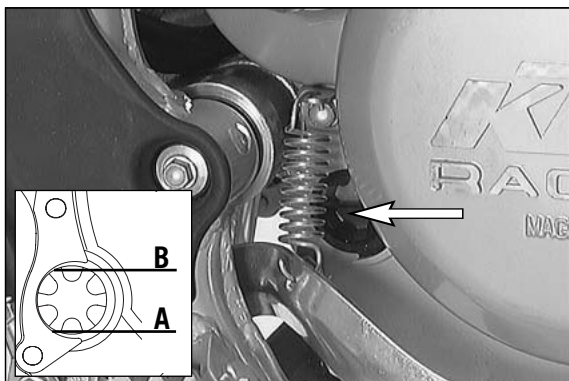
In the following 12 operating hours, you may load the engine up to 75% of its capacity. Use the motorcycle on various types of terrain (road, easy off-road trails).

! CAUTION

THE 250/400/450/525 SX/MXC/EXC RACING MODELS WERE UNCOM-
PROMISINGLY DESIGNED FOR OFF-ROAD COMPETITION PURPOSES
ONLY. "ON THE ROAD" APPROVED MODELS ARE ONLY ALLOWED ON
PUBLIC ROADS IN THE ORIGINAL HOMOLOGATED (THROTTLED)
VERSION. AVOID EXTENDED ON-ROAD RIDES AT FULL THROTTLE.

⚠ WARNING

- WEAR SUITABLE CLOTHING WHEN DRIVING A MOTORCYCLE. CLEVER KTM DRIVERS ALWAYS WEAR A HELMET, BOOTS, GLOVES AND A JACKET, REGARDLESS OF WHETHER DRIVING ALL DAY OR JUST FOR A SHORT TRIP. THE PROTECTIVE CLOTHING SHOULD BE BRIGHTLY COLORED SO THAT OTHER VEHICLES CAN SEE YOU AS EARLY AS POSSIBLE.
- ALWAYS TURN ON THE LIGHT TO MAKE SURE THAT OTHER DRIVERS BECOME AWARE OF YOU AS EARLY AS POSSIBLE.
- DO NOT DRIVE AFTER HAVING CONSUMED ALCOHOL.
- ONLY USE ACCESSORIES RECOMMENDED BY KTM. FOR EXAMPLE, FRONT PANNELLING CAN IMPAIR THE DRIVING PROPERTIES OF THE MOTORCYCLE. CASES, EXTRA TANKS, ETC. CAN ALTER THE WEIGHT DISTRIBUTION AND THUS ALSO IMPAIR THE VEHICLES DRIVING PROPERTIES.
- THE FRONT AND REAR WHEEL MAY ONLY BE FITTED WITH TIRES THAT HAVE THE SAME PROFILE TYPE.
- THE RACING MODELS ARE DESIGNED AND DIMENSIONED FOR 1 PERSON ONLY. NEVER TAKE ANOTHER RIDER ALONG.
- OBSERVE THE TRAFFIC REGULATIONS, DRIVE DEFENSIVELY AND TRY TO LOOK AHEAD AS FAR AS POSSIBLE SO THAT ANY HAZARDS CAN BE RECOGNIZED AS EARLY AS POSSIBLE.
- ADJUST YOUR DRIVING SPEED ACCORDING TO THE CONDITIONS AND YOUR DRIVING SKILLS.
- DRIVE CAREFULLY ON UNKNOWN ROADS OR ON UNFAMILIAR TRIALS.
- WHEN DRIVING OFF-ROAD, ALWAYS HAVE A FRIEND ON A SECOND MOTORCYCLE TO KEEP YOU COMPANY, SO THAT YOU CAN HELP EACH OTHER SHOULD DIFFICULTIES ARISE.
- REPLACE THE HELMET VISOR OR GOGGLE LENS WHEN SCRATCHED OR DAMAGED. IF BRIGHT LIGHT SHINES THROUGH A SCRATCHED VISOR OR LENS, THE OPERATOR WILL BE BLINDED.
- NEVER LEAVE YOUR MOTORCYCLE WITHOUT SUPERVISION IF THE ENGINE IS RUNNING.
- THE SX/SXS/MXC MODELS ARE NOT APPROVED FOR USE ON PUBLIC ROADS AND FREEWAYS.
- WHEN RIDING YOUR MOTORCYCLE, PLEASE BEAR IN MIND THAT OTHER PEOPLE MAY FEEL MOLESTED BY EXCESSIVE NOISE.

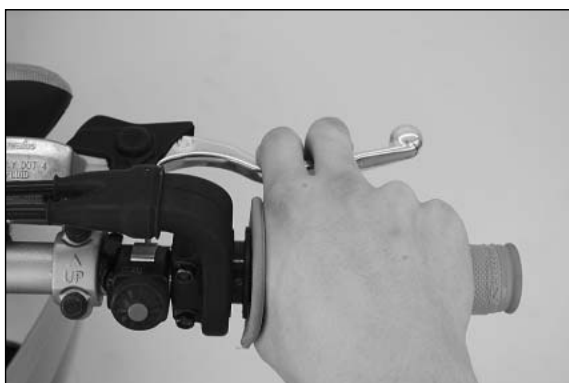


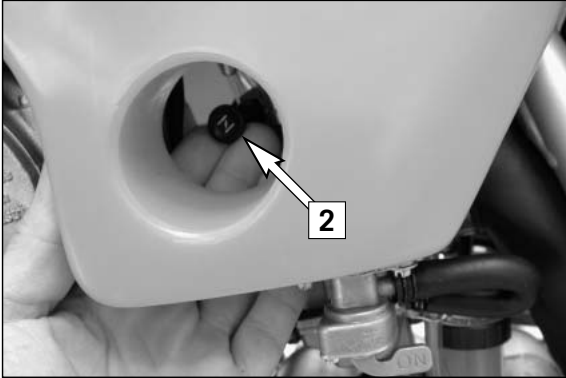
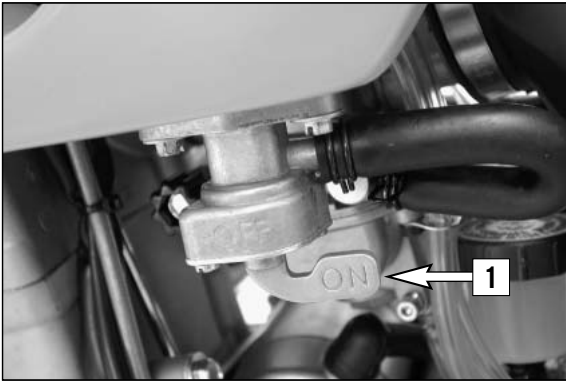
Check the following before each start

When you start off, the motorcycle must be in perfect technical condition. For safety reasons, you should make a habit of performing an overall check of your motorcycle before each start.

The following checks should be performed:

- 1 **CHECK THE OIL LEVEL**
Insufficient oil results in premature wear and consequently to engine damage.
- 2 **FUEL**
Check that there is sufficient fuel in the tank; when closing the filler cap, check that the tank venting hose is free of kinks.
- 3 **CHAIN**
A loose chain can fall from the chain wheels; an extremely worn chain can tear, and insufficient lubrication can result in unnecessary wear to the chain and chain wheels. Excessive tensioning of the chain will put additional load on the components of the secondary drivetrain (chain, bearings of transmission and rear wheel). Aside from resulting in premature wear, if worst comes to worst the chain may rupture or the countershaft of the transmission may break.
- 4 **TIRES**
Check for damaged tires. Tires showing cuts or dents must be replaced. The tread depth must comply with the legal regulations. Also check the air pressure. Insufficient tread and incorrect air pressure deteriorate the driving performance.
- 5 **BRAKES**
Check correct functioning of the braking system. Check for sufficient brake fluid in the reservoir. The reservoirs have been designed in such a way that brake fluid does not need to be refilled even when the brake pads are worn. If the level of brake fluid falls below the minimum value, this indicates a leak in the braking system or completely worn out brake pads. Arrange for the braking system to be checked by a KTM specialist, as complete failure of the braking system can be avoided. Also check the state of the brake hose and the thickness of the brake linings. Check free travel at the hand brake lever and foot brake lever.
- 6 **CABLES**
Check correct setting and easy running of all control cables.
- 7 **COOLING FLUID**
Check the level of the cooling fluid when the engine is cold.
- 8 **ELECTRICAL SYSTEM**
Check correct functioning of headlamps, tail-lights, brake lights, indicators, control lamps and horn while the engine is running.
- 9 **LUGGAGE**
If you are taking luggage with you, check that this is securely fastened.





Starting when the engine is cold

- 1 Open the fuel tap [1].
- 2 Swing up the side stand or center stand.
- 3 Put the gear in neutral.
- 4 Operate the choke [2].
- 5 Leave throttle closed and kick the kickstarter briskly ALL THE WAY or actuate the E-starter.

⚠ WARNING

- IF YOU WANT TO START THE ENGINE, MAKE SURE THAT YOU ALWAYS PUT ON STURDY MOTORCYCLE BOOTS IN ORDER TO AVOID INJURIES. YOU MIGHT SLIP OFF THE KICKSTARTER, OR THE ENGINE MAY KICK BACK AND PROPEL YOUR FOOT UPWARD WITH GREAT FORCE.
- ALWAYS KICK THE KICKSTARTER BRISKLY ALL THE WAY WITHOUT OPENING THE THROTTLE. IF YOU DO NOT KICK HARD ENOUGH, WITH AN OPEN THROTTLE GRIP, THE KICK-BACK HAZARD WILL BE HIGHER.
- DO NOT START THE ENGINE AND ALLOW IT TO IDLE IN A CLOSED AREA. EXHAUST FUMES ARE POISONOUS AND CAN CAUSE LOSS OF CONSCIOUSNESS AND DEATH. ALWAYS PROVIDE ADEQUATE VENTILATION WHILE THE ENGINE IS RUNNING.
- ALWAYS VERIFY THAT THE TRANSMISSION HAS BEEN SET TO IDLE (NEUTRAL) BEFORE ACTUATING THE STARTER BUTTON. IF YOU START THE MOTORCYCLE WITH A GEAR ENGAGED, THE MOTORCYCLE WILL MOVE FORWARD.

! CAUTION

- MAXIMAL PERIOD FOR CONTINUOUS STARTING: 5 SECONDS. WAIT AT LEAST 5 SECONDS BEFORE TRYING AGAIN.
- DON'T RIDE YOUR MOTORCYCLE WITH FULL LOAD AND DON'T REV UP THE ENGINE WHEN COLD BECAUSE THE PISTON IS WARMING UP FASTER THAN THE WATER COOLED CYLINDER AND CAN CAUSE ENGINE DAMAGE.

Starting when the engine is warm

- 1 Open the fuel tap [1].
- 2 Swing up the side stand.
- 3 Put the gear in neutral.
- 4 Leave throttle closed and kick the kickstarter briskly ALL THE WAY or actuate the E-starter.

What to do when the engine is "flooded"

In the event of a fall, more fuel than necessary may get into the engine. In order to "pump the engine free", pull the hand decompression lever, fully rev up the engine, actuate the kickstarter 5 to 10 times or actuate the E-starter 2 times for 5 seconds each. Then, start the engine as described above.

If the engine fails to start, unscrew the spark plug and dry it.

NOTE:

The carburetor has an accelerator pump. Every time you open the throttle, fuel will be injected into the intake passage. When starting, be sure that you open the throttle completely only once.

Starting off

Pull the clutch lever. Put the engine into first gear, slowly release the clutch lever and open the throttle at the same time.

⚠ WARNING

BEFORE YOU START OFF, CHECK THAT THE SIDE STAND HAS BEEN SWUNG UP FULLY. IF THE STAND DRAGS ON THE GROUND, THE MOTORCYCLE CAN GO OUT OF CONTROL.

Shifting/Riding

You are now in first gear, referred to as the drive or uphill gear. Depending on the conditions (traffic, hill size, etc.), you can shift to a higher gear. Close throttle, at the same time pull clutch lever in and shift to the next higher gear. Let clutch lever go again and accelerate. If you turned on the choke, make sure you turn it off again as soon as engine is warm.

When you reach full speed through opening the throttle all the way, turn throttle back to 3/4; the speed hardly decreases although the engine will use less gas. Only give as much gas as the engine can handle. Through quick and high revving of the throttle, the fuel usage increases.

By shifting down, use the brakes if necessary and close the throttle at the same time. Pull the clutch lever and shift down to the next gear. Let clutch lever go slowly and open the throttle or shift down again.

NOTE:

Dedicated to nothing but offroad racing, 250/400/450/525 SX/MXC/EXC Racing models make no compromises in their design. As such, they do not include any radiator fan, and the size of the radiator is dimensioned for optimum ergonomics.

In normal racing, the cooling system is sufficient.

If you use your motorbike in other conditions, please note that: the E-starter allows you to start MXC/EXC Racing models again at any time. Therefore, turn off the engine if you intend to run your motorcycle in idle or at a standstill for longer periods of time (more than 2 minutes).

Avoid letting the clutch slip frequently and for extended periods. This would cause the engine oil to heat up, thereby heating up the cooling system. You should drive at low speeds (4-stroke style - letting the engine pull you) and not at high speeds not by letting the clutch slip (2-stroke style).

⚠ WARNING

- AFTER FALLING WITH THE MOTORCYCLE, CHECK ALL FUNCTIONS THOROUGHLY BEFORE STARTING UP OPERATIONS AGAIN.
- A TWISTED HANDLEBAR MUST ALWAYS BE REPLACED. DO NOT ADJUST THE HANDLEBAR, IT WILL LOSE STABILITY.

! CAUTION

- HIGH RPM RATES WHEN THE ENGINE IS COLD HAVE AN ADVERSE EFFECT ON THE LIFE OF YOUR ENGINE. WE RECOMMEND YOU RUN THE ENGINE IN A MODERATE RPM RANGE FOR A FEW MILES GIVING IT A CHANCE TO WARM UP. AFTER THAT NO FURTHER PRECAUTIONS IN THIS RESPECT NEED TO BE TAKEN. THE ENGINE HAS REACHED ITS OPERATING TEMPERATURE AS SOON AS THE RADIATORS BECOME WARM.
- NEVER HAVE THE THROTTLE WIDE OPEN WHEN CHANGING DOWN TO A LOWER GEAR. THE ENGINE WILL OVER-REV, DAMAGING THE VALVES. IN ADDITION, THE REAR WHEEL LOCKS SO THAT THE MOTORCYCLE CAN EASILY GET OUT OF CONTROL.
- IF ANY ABNORMAL VIBRATIONS OCCUR WHILE DRIVING, CHECK THAT THE ENGINE FASTENING BOLTS ARE TIGHT.
- IN THE EVENT THAT, WHILE RIDING ON YOUR MOTORCYCLE, YOU NOTICE ANY UNUSUAL OPERATION-RELATED NOISE, STOP IMMEDIATELY, TURN THE ENGINE OFF, AND CONTACT AN AUTHORIZED KTM DEALER.

Braking

Close throttle and apply the hand and foot brakes at the same time. When driving on sandy, wet or slippery ground use mainly the rear wheel brake. Always brake with feeling, blocking wheels can cause you to skid or fall. Also change down to lower gears depending on your speed.

When driving down hill, use the braking effect of the engine. Change down one or two gears but do not overspeed the engine. In this way, you will not need to brake so much and the brakes will not overheat.

⚠ WARNING

- IN CASE OF RAIN, AFTER WASHING THE MOTORCYCLE, AFTER RIDES THROUGH WATER AND IN CASE OF RIDES ON WET OFF-ROAD TRACKS, HUMID OR DIRTY BRAKE DISCS CAN DELAY THE BRAKING EFFECT. THE BRAKES MUST BE PULLED UNTIL THEY ARE DRY OR CLEAN.
- RIDES ON SALT-STREWED OR DIRTY ROADS CAN ALSO DELAY THE BRAKING EFFECT. THE BRAKES MUST BE PULLED UNTIL THEY ARE CLEAN.
- DIRTY BRAKE DISCS CAUSE INCREASED TEAR OF BRAKE PADS AND BRAKE DISCS.
- WHEN YOU BRAKE, THE BRAKE DISCS, BRAKE PADS, BRAKE CALIPER AND BRAKE FLUID HEAT UP. THE HOTTER THESE PARTS GET, THE WEAKER THE BRAKING EFFECT. IN EXTREME CASES, THE ENTIRE BRAKING SYSTEM CAN FAIL.
- IF THE RESISTANCE IN THE HAND BRAKE LEVER OR FOOT BRAKE PEDAL FEELS "SPONGY" (TOO MUCH PLAY), THIS IS AN INDICATION THAT SOMETHING IS WRONG WITH THE BRAKE SYSTEM. DON'T RIDE YOUR MOTORCYCLE ANYMORE WITHOUT FIRST HAVING THE BRAKE SYSTEM LOOKED OVER BY A KTM DEALER.

Stopping and parking

Apply the brakes fully and put the engine into neutral. To turn off the engine, push the short-circuit button or the emergency-OFF button with the engine at idling speed until the engine stops. Turn the fuel tap to the OFF position, park on an area where the ground is firm, and lock the motorcycle.

⚠ WARNING

MOTORCYCLE ENGINES PRODUCE A GREAT AMOUNT OF HEAT WHILE RUNNING. THE ENGINE, EXHAUST PIPE, MUFFLER, BRAKE ROTORS, AND SHOCK ABSORBERS CAN BECOME VERY HOT. DO NOT TOUCH ANY OF THESE PARTS AFTER OPERATING THE MOTORCYCLE, AND TAKE CARE TO PARK IT WHERE PEDESTRIANS ARE NOT LIKELY TO TOUCH IT AND GET BURNED.

! CAUTION

- NEVER USE THE HAND DECOMPRESSION LEVER TO TURN OFF THE ENGINE. USE THE SHORT-CIRCUIT BUTTON OR THE EMERGENCY-OFF BUTTON INSTEAD.
- CLOSE THE FUEL TAP WHEN LEAVING YOUR VEHICLE. OTHERWISE THE CARBURETTOR CAN FLOOD AND FUEL WILL ENTER THE ENGINE.
- NEVER PARK YOUR MOTORCYCLE IN PLACES WHERE THERE ARE FIRE HAZARDS DUE TO DRY GRASS OR OTHER EASILY FLAMMABLE MATERIALS.



NOTE REGARDING THE SIDE STAND:

Use your foot to kick side stand forward up to the stop and lean the motorcycle sideways. Make sure that the ground is solid and that your motorcycle is standing securely. Just in case, you can shift into first gear.

! CAUTION

THE SIDE STAND IS DESIGNED TO BEAR ONLY THE LOAD OF THE MOTORCYCLE. THE SIDE STAND AND/OR THE FRAME CAN BE DAMAGED AND THE MOTORCYCLE CAN FALL OVER IF YOU MOUNT THE MOTORCYCLE, THUS PUTTING AN ADDITIONAL LOAD ON THE SIDE STAND.

Fuel

The racing engine needs unleaded fuel with at least RON 95 (USA = Premium RON 91).

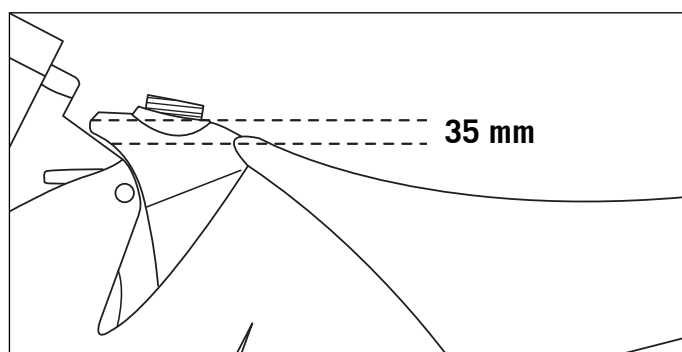
! CAUTION

USE LEADED OR UNLEADED PREMIUM GRADE GASOLINE (95 OCTANES). NEVER USE GASOLINE HAVING LESS THAN 95 OCTANES BECAUSE IT MAY DAMAGE THE ENGINE.

⚠ WARNING

GASOLINE IS HIGHLY FLAMMABLE AND POISONOUS. EXTREME CAUTION SHOULD BE USED WHEN HANDLING GASOLINE. DO NOT REFUEL THE MOTORCYCLE NEAR OPEN FLAMES OR BURNING CIGARETTES. ALWAYS SWITCH OFF THE ENGINE BEFORE REFUELLING. BE CAREFUL NOT TO SPILL GASOLINE ON THE ENGINE OR EXHAUST PIPE WHILE THE ENGINE IS HOT. WIPE UP SPILLS PROMPTLY. IF GASOLINE IS SWALLOWED OR SPLASHED IN THE EYES, SEEK A DOCTOR'S ADVICE IMMEDIATELY.

Fuel expands when its temperature rises. Therefore do not fill the tank to the top (see fig.).



PERIODIC MAINTENANCE »

A CLEAN MOTORCYCLE CAN BE CHECKED MORE QUICKLY WHICH SAVES MONEY!		1. service after 3 hours or 20 l fuel	after/every 15 hours or 100 l fuel
ENGINE	Change engine oil, short and long oil filters	●	●
	Clean oil screen and drain plug magnet	●	●
	Check oil lines for damage or bends	●	●
	Replace spark plug (after 30 hours)		
	Check and adjust valve clearance	●	●
	Check engine mounting bolts for tightness	●	●
CARBURETOR	Check carburetor connection boot for cracks and leaks		●
	Check idle speed setting	●	●
	Check vent hoses for damage or bends	●	●
ADD- ON PARTS	Check cooling system for leaks, check quantity of antifreeze	●	●
	Check exhaust system for leaks and fitment		●
	Check cables for damage, smooth operation and bends adjust and lubricate	●	●
	Check fluid level of the clutch master cylinder	●	●
	Clean air filter and filter box		●
	Check electric wires for damage and bends		●
	Check headlamp setting		●
	Check function of electric systems (low high beam, brake light, indicator lamps, speedometer illumination, horn, emergency OFF switch or button)	●	●
BRAKES	Check brake fluid level, lining thickness, brake discs	●	●
	Check brake lines for damage and leaks	●	●
	Check/function smooth operation and adjust free travel of handbrake/foot brake lever	●	●
	Check tightness of brake system screws	●	●
CHASSIS	Check shock absorber and fork for leaks and function	●	●
	Clean fork dust bellows		●
	Bleed fork legs		●
	Check swing arm bearings		●
	Check/adjust steering head bearings	●	●
	Check tightness of chassis screws (triple clamps, fork leg axle passage)	●	●
WHEELS	Check spoke tension and rim joint	●	●
	Check tires and air pressure	●	●
	Check chain, chain joint, rear sprockets and chain guides for wear, fit and tension	●	●
	Lubricate chain	●	●
	Check clearance of wheel bearings	●	●

IMPORTANT RECOMMENDED MAINTENANCE WORK THAT CAN BE CARRIED OUT BY EXTRA ORDER	
	at least once a year
Complete maintenance of fork	●
Complete maintenance of shock absorber	●
Clean and grease steering head bearings and gasket elements	●
Clean and adjust carburetor	●
Replace glass fibre yarn filling of the exhaust main silencer	●
Treat electric contacts and switches with contact spray	●
Treat battery connections with contact grease	●
Change hydraulic clutch fluid	●
Change brake fluid	●

IF MOTORCYCLE IS USED FOR COMPETITION 15 HOURS SERVICE SHOULD BE CARRIED OUT AFTER EVERY RACE.
Service intervalls should never be exceeded by more than 2 hours or 15 liters of fuel.
Maintenance work done by KTM authorised workshops is not a substitute for care and checks done by the rider.

PERIODIC MAINTENANCE »

IMPORTANT CHECKS AND MAINTENANCE TO BE CARRIED OUT BY THE RIDER			
	Before each start	After every cleaning	For cross-country use
Check oil level	●		
Check brake fluid level	●		
Check brake pads for wear	●		
Check lights for function	●		
Check horn for function	●		
Lubricate and adjust cables and nipples		●	
Bleed fork legs regularly			●
Remove and clean fork dust bellows regularly			●
Clean and lubricate chain, check tension and adjust if necessary		●	●
Clean air filter and filter box			●
Check tires for pressure and wear	●		
Check cooling fluid level	●		
Check fuel lines for leaks	●		
Drain and clean float chamber		●	
Check all control elements for smooth operation	●		
Check brake performance	●	●	
Treat blank metal parts (with the exception of brake and exhaust system) with wax-based anti corrosion agent		●	
Treat ignition and steering locks and light switches with contact spray		●	
Check tightness of screws, nuts and hose clamps regularly			●

PERIODIC MAINTENANCE »

RECOMMENDED INSPECTION OF THE 250/400/450/525 SX AND EXC ENGINE USED FOR ENDURO COMPETITIONS BY YOUR KTM WORKSHOP (ADDITIONAL ORDER FOR THE KTM WORKSHOP)							
a 100 liter fuel consumption is equivalent to approx. 15 operating hours	15 hours 100 liter	30 hours 200 liter	45 hours 300 liter	60 hours 400 liter	90 hours 600 liter	120 hours 800 liter	35 hours 900 liter
Check the clutch disks for wear	●	●	●	●	●	●	●
Check the length of the clutch springs		●	●	●	●	●	●
Check the cylinder and piston for wear			●		●		●
Check the groove on the piston pin retainer for wear (visual check)			●		●		●
Check the camshaft for wear (visual check)			●		●		●
Replace the camshaft bearings			●		●		●
Check the length of the valve springs			●		●		●
Check the spring cap for wear			●		●		●
Check the eccentricity of the valve disk			●		●		●
Check the valve guides for wear			●		●		●
Check the radial clearance of the rocker arm rollers			●		●		●
Check the elongation of the timing chain			●		●		●
Check the chain tensioner tooting for damage (visual check)		●	●	●	●	●	●
Check the eccentricity of the crankshaft journal			●		●		●
Replace the conrod bearings			●		●		●
Check piston pin bearing			●		●		●
Replace the balancer shaft bearings			●		●		●
Replace the crankshaft main bearings			●		●		●
Check the entire transmission including the roller and bearings for wear			●		●		●
Check the length of the bypass valve spring			●		●		●

NOTE: IF THE INSPECTION ESTABLISHES THAT PERMISSIBLE TOLERANCES ARE EXCEEDED, THE RESPECTIVE COMPONENTS MUST BE REPLACED.

PERIODIC MAINTENANCE »

RECOMMENDED INSPECTION OF THE 250/400/450/525 EXC ENGINE USED FOR HOBBY - ENDURO COMPETITIONS BY YOUR KTM WORKSHOP (ADDITIONAL ORDER FOR THE KTM WORKSHOP)

a 100 liter fuel consumption is equivalent to approx. 15 operating hours	30 hours 200 liter	60 hours 400 liter	90 hours 600 liter	120 hours 800 liter	180 hours 1200 liter	240 hours 1600 liter	270 hours 1800 liter
Check the clutch disks for wear	●	●	●	●	●	●	●
Check the length of the clutch springs		●	●	●	●	●	●
Check the cylinder and piston for wear			●		●		●
Check the groove on the piston pin retainer for wear (visual check)			●		●		●
Check the camshaft for wear (visual check)			●		●		●
Replace the camshaft bearings			●		●		●
Check the length of the valve springs			●		●		●
Check the spring cap for wear			●		●		●
Check the eccentricity of the valve disk			●		●		●
Check the valve guides for wear			●		●		●
Check the radial clearance of the rocker arm rollers			●		●		●
Check the elongation of the timing chain			●		●		●
Check the chain tensioner tooting for damage (visual check)		●	●	●	●	●	●
Check the eccentricity of the crankshaft journal			●		●		●
Replace the conrod bearings			●		●		●
Check piston pin bearing			●		●		●
Replace the balancer shaft bearings			●		●		●
Replace the crankshaft main bearings			●		●		●
Check the entire transmission including the roller and bearings for wear			●		●		●
Check the length of the bypass valve spring			●		●		●

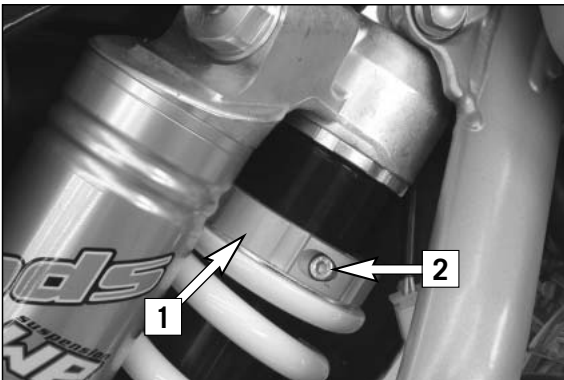
NOTE: IF THE INSPECTION ESTABLISHES THAT PERMISSIBLE TOLERANCES ARE EXCEEDED, THE RESPECTIVE COMPONENTS MUST BE REPLACED.

⚠ WARNING

MAINTENANCE AND ADJUSTING WORK MARKED WITH AN ASTERISK (*) REQUIRES EXPERT SKILLS AND TECHNICAL KNOW-HOW. FOR YOUR OWN SAFETY, ALWAYS HAVE SUCH WORK PERFORMED BY A SPECIALIZED KTM DEALER WHERE YOUR MOTORCYCLE WILL BE OPTIMALLY SERVICED BY APPROPRIATELY QUALIFIED, SKILLED STAFF.

! CAUTION

- WHEN CLEANING THE MOTORCYCLE, DO NOT USE A HIGH PRESSURE CLEANING UNIT IF POSSIBLE, OTHERWISE WATER WILL PENETRATE THE BEARINGS, CARBURETOR, ELECTRIC CONNECTORS, ETC.
- WHEN TRANSPORTING YOUR KTM, ENSURE THAT IT IS HELD UPRIGHT WITH RESTRAINING STRAPS OR OTHER MECHANICAL FASTENING DEVICES AND THAT THE FUEL TAP IS IN THE OFF POSITION - IF THE MOTORCYCLE SHOULD FALL OVER, NO FUEL CAN LEAK FROM THE CARBURETOR OR FUEL TANK
- ONLY USE SPECIAL SCREWS WITH AN APPROPRIATE THREAD LENGTH SUPPLIED BY KTM TO FIX THE SPOILERS ON THE TANK. USING OTHER SCREWS OR LONGER SCREWS CAN CAUSE LEAKS IN THE TANK THROUGH WHICH FUEL CAN FLOW OUT.
- DO NOT USE TOOTHED WASHERS OR SPRING RINGS WITH THE ENGINE FASTENING SCREWS, AS THESE WORK INTO THE FRAME PARTS AND KEEP WORKING LOOSE. INSTEAD, USE SELF-LOCKING NUTS.
- LET YOUR MOTORCYCLE COOL DOWN BEFORE BEGINNING ANY MAINTENANCE WORK IN ORDER TO AVOID GETTING BURNED.
- DISPOSE OILS, FATTY MATTERS, FILTERS, FUELS, WASHING DETERGENTS ETC. PROPERLY.
- UNDER NO CIRCUMSTANCES MAY USED OIL BE DISPOSED OF IN THE SEWAGE SYSTEM OR IN THE OPEN COUNTRYSIDE. 1 LITER OF USED OIL CONTAMINATES 1,000,000 LITERS OF WATER.



Changing the spring preloading of the shock absorber

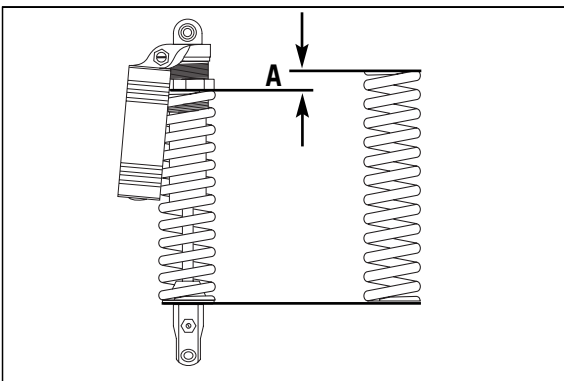
The spring preload can be changed by turning the adjusting ring [1]. For this purpose, you should dismount the shock absorber and clean it thoroughly.

NOTE:

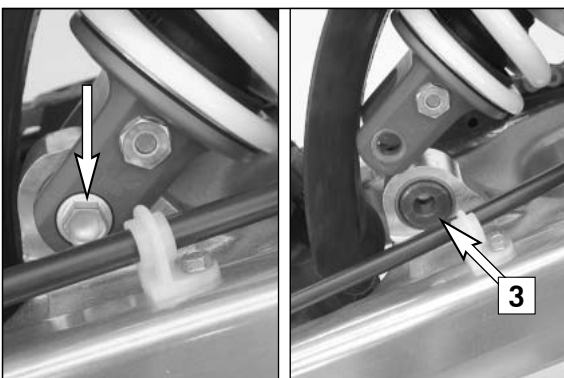
- Before changing the spring preload note down the basic setting, e.g. how many threads are visible above the adjusting ring.
- One rotation of the adjusting ring [1] changes the spring pretension by approximately 1.75 mm (0.07 in).

Loosen the clamping screw [2] and use the hook wrench contained in the vehicle tool set to turn the adjusting ring as desired. Turning it counterclockwise will reduce the preload, turning it clockwise will increase the preload.

After readjusting the clamping screw [2], tighten it to 8 Nm.



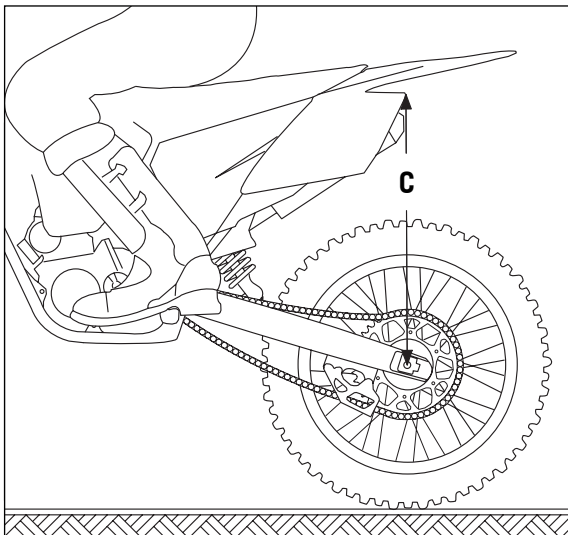
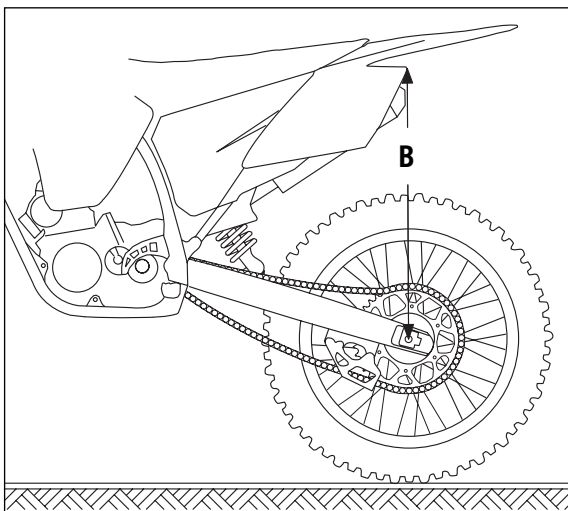
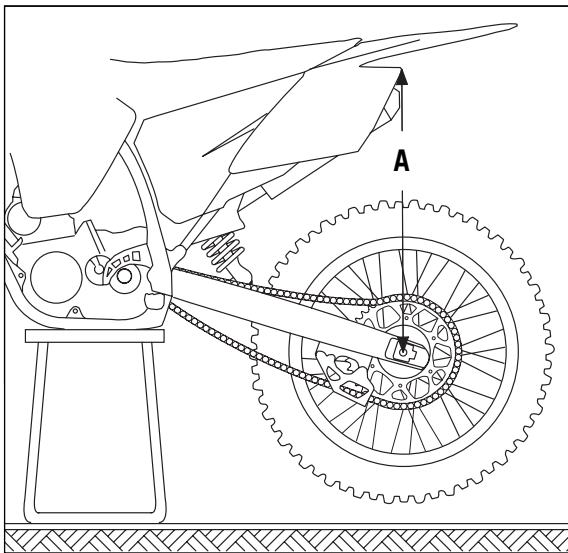
ADJUSTMENT VALUES - SPRING PRELOAD A	
minimum preload.....	4 mm (0,15 in)
STANDARD PRELOAD.....	7 mm
maximum preload	10 mm (0,4 in)



Pivot bearing

The pivot bearing [3] for PDS suspension struts at the swinging fork is Teflon-coated and must not be lubricated with either grease or other lubricants. Grease and other lubricants cause the Teflon coat to dissolve, whereby the bearing's lifecycle will be reduced dramatically.

When cleaning your bike with a high-pressure cleaner, do not aim the high-pressure spray directly at the pivot bearing.



Basic suspension setup for the weight of the driver

To achieve maximum handling performance and to prevent the fork, shock absorber, swing arm and frame from being damaged, the basic setup of the suspension components must be suitable for your weight. At delivery, KTM's offroad motorcycles are set to accommodate a driver weighing 70 - 80 kg (wearing full protective clothing). If your weight exceeds or falls short of this range, you will need to adjust the basic setup for the suspension components accordingly. Minor deviations in weight can be compensated by adjusting the spring preload. Different springs must be installed for larger deviations.

Checking the shock absorber and spring

You can establish whether or not the shock absorber spring is suitable for your weight by checking the riding sag. The static sag must be correctly adjusted before the riding sag can be determined.

Determining the static sag of the shock absorber

The static sag should be as close as possible to 35 mm. Deviations of more than 2 mm can strongly influence the motorcycle's performance.

Procedure:

- Jack up the motorcycle until the rear wheel no longer touches the ground.
- Measure the vertical distance between the rear wheel axle and a fixed point (e.g. a mark on the side cover) and write it down as dimension A.
- Place the motorcycle on the ground again.
- Ask a helper to hold the motorcycle in vertical position.
- Measure the distance between the rear axle and the fixed point again to establish dimension B.
- The static sag is the difference between dimensions A and B.

EXAMPLE:

Motorcycle jacked up (dimension A)	.....	.600 mm
Motorcycle on ground, unloaded (dimension B)	.....	– 565 mm
Static sag	.....	.35 mm

If the static sag is lower, the spring preload of the shock absorber must be reduced, if the static sag is higher, the spring preload must be increased. See chapter "Changing the spring preload of the shock absorber."

Determining the riding sag of the shock absorber

- Have a helper hold the motorcycle while you sit on the bike in a normal seating position (feet on the footrests) wearing full protective clothing and bounce up and down a few times to allow the rear wheel suspension to become level.
- Stay on the bike and have another person measure the distance between the same two points and write it down as dimension C.
- The riding sag is the difference between dimensions A and C.

EXAMPLE:

Motorcycle jacked up (dimension A)	.....	.600 mm
Motorcycle on ground, loaded (dimension C)	.....	– 510 mm
Riding sag	.....	.90 mm

The riding sag should lie between 90 and 105 mm.

If the riding sag is less than 90 mm, the spring is too hard (the spring rate is too high). If the riding sag is more than 105 mm, the spring is too soft (the spring rate is too low).

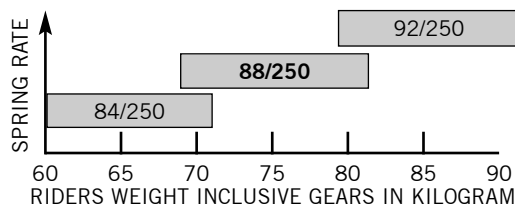
The spring rate is written on the outside of the spring (e.g. 88/250). The type number of the shock absorber is embossed on the bottom of the tank.

The illustrations show which spring should be installed. The standard spring is shown in bold print.

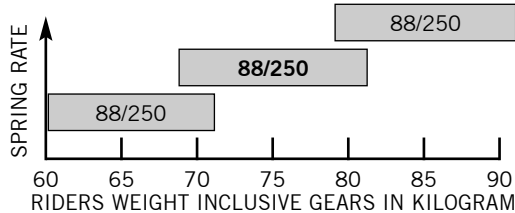
After installing a different spring, readjust the static sag to 35 mm (± 2 mm).

PDS 12187A05

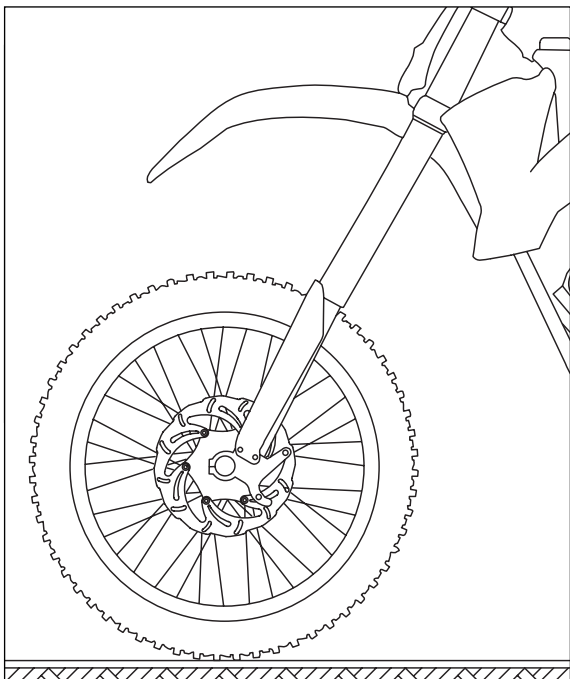
450/525 SX



PDS 12187A06 250/400/450/525 MXC/MXC-Desert/EXC/EXC-G



According to our experience, the damping rate of the compression stage can remain unchanged. The damping rate of the rebound stage can be reduced by a few clicks for a softer spring or increased by a few clicks for a harder spring.



Checking the basic setup of the telescopic fork

The precise riding sag of the telescopic fork cannot be determined for various reasons. Similar to the shock absorber, smaller deviations in your weight can be compensated by adjusting the spring preload. However, if your telescopic fork bumps frequently (hard end stop during compression), you should install harder fork springs to avoid damaging the telescopic fork and frame.

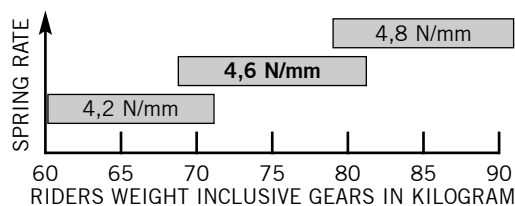
Changing the spring preload on the telescopic fork (SX models)

The telescopic forks of the SX models come with a preload adjuster for easy adjustment of the spring preload. You can adjust the spring preload ± 9 mm by turning the adjusting screws (basic position = middle position).

NOTE:

Always turn the adjusting screws the same distance on both fork legs. Different spring preloads on the fork legs will reduce the telescopic fork's response.

14187A05 450/525 SX



Changing the spring preload on the telescopic fork (MXC/EXC models)

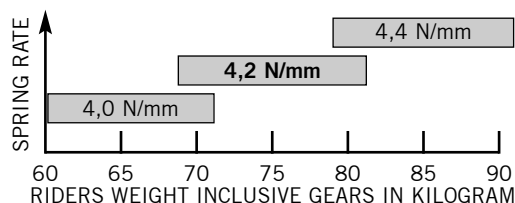
The telescopic forks for these models must be partly disassembled to adjust the spring preload (see WP manual). Pretension spacers are available in heights of 1.5, 2.5 and 5 mm (see spare parts catalog). The fork springs may not be pretensioned by more than 20 mm.

The preload adjuster used in the SX models can easily be retrofitted for the telescopic forks of the MXC/EXC models.

NOTE:

WP precisely adjusts the spring pressure by inserting pretension spacers. Fluctuations in production are compensated with pretension spacers in various heights. This can cause the fork springs in the fork legs to have different degrees of pretension. Fork springs and pretension spacers should always stay together.

14187A06 250/400/450/525 MXC/MXC-Desert/EXC/EXC-G

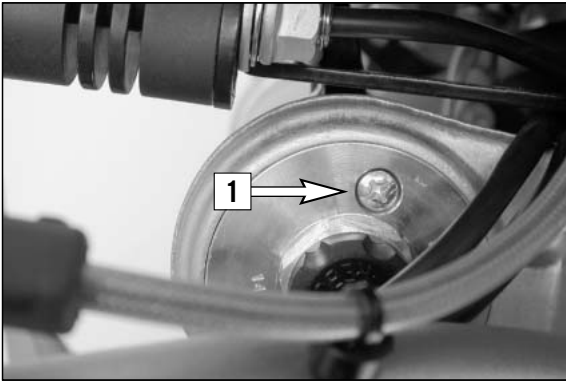


Replacing fork springs

If you weigh less than 70 kg or more than 80 kg, you should install the respective fork springs. The correct spring rate is shown in the illustrations. The standard spring is shown in bold print. The type number of the telescopic fork is embossed on the caps on the top of the telescopic fork.

If you are uncertain which spring to use, contact your KTM workshop.

According to our experience, the damping rate of the compression stage can remain unchanged. The damping rate of the rebound stage can be reduced by a few clicks for a softer spring or increased by a few clicks for a harder spring.

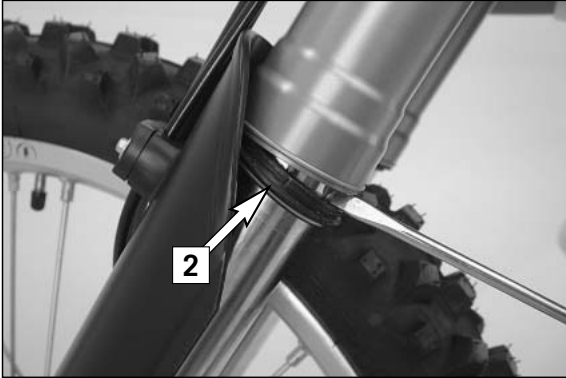


Breather plug front fork

After every 5 hours of use for competitive racing, slacken the breather plugs [1] a few turns in order to relieve excess pressure from the inside of the fork. To do this, place the motorcycle on a stand with the front wheel lifted off the ground. When riding the motorcycle mainly on the road, it will suffice to have this job performed in the course of the periodical maintenance service.

! CAUTION

EXCESSIVE PRESSURE IN THE INTERIOR OF THE FORK CAN CAUSE LEAKS IN THE FORK. IF YOUR FORK IS LEAKING, IT IS RECOMMENDED TO OPEN THE BREATHER PLUGS BEFORE HAVING THE SEALS REPLACED.



Cleaning the dust sleeves of the telescopic fork

The dust-protection bellows [2] are to remove dust and coarse dirt particles from the fork tube. However, after some time, dirt may also get in behind the dust-protection bellows. If this dirt is not removed, the oil sealing rings located behind it may start to leak.

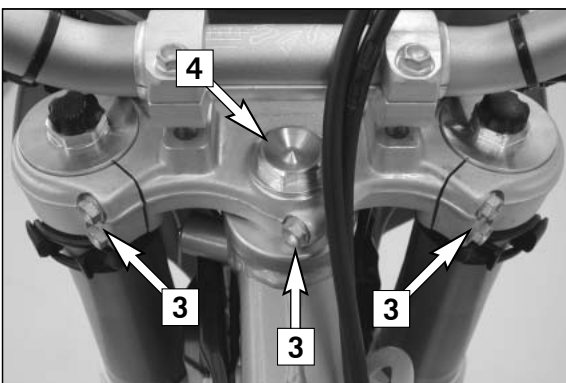
Use a screwdriver to lift the dust-protection bellows out of the outer tubes and slide them downward.



Clean the dust-protection bellows, outer tubes, and fork tubes thoroughly, and oil them thoroughly with Universal oil spray (Motorex Joker 440) or engine oil. Then, push the dust-protection bellows into the outer tubes by hand.

⚠ WARNING

NO OIL MAY REACH THE FRONT TIRE OR THE BRAKE DISKS SINCE THIS WOULD CONSIDERABLY REDUCE THE TIRE'S ROAD GRIP AND THE BRAKING EFFECT OF THE FRONT BRAKE.



Checking and adjusting the steering head bearing *

Check steering head bearing for play periodically. To check, put the motorcycle on a stand so that the front wheel is off the ground. Now try to move the fork forward and backward. For readjusting, loosen the five pinch bolts [3] of the top triple clamp and turn steering stem bolt clockwise [4] until there is no more play. Don't tighten the steering stem bolt all the way, otherwise the bearings will be damaged. With a plastic hammer, lightly tap on the triple clamp to release tension. Retighten the five pinch bolts to 20 Nm(EXC) and 15 Nm (SX).

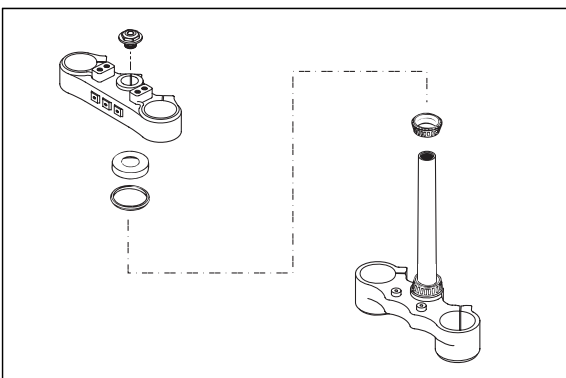
⚠ WARNING

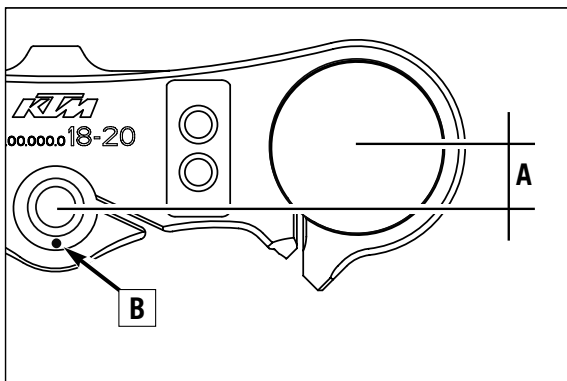
IF THE STEERING HEAD BEARING IS NOT ADJUSTED TO BE FREE OF PLAY, THE MOTORCYCLE WILL EXHIBIT UNSTEADY DRIVING CHARACTERISTICS AND CAN GET OUT OF CONTROL.

! CAUTION

IF YOU DRIVE WITH PLAY IN THE STEERING HEAD BEARING FOR LONGER PERIODS, THE BEARINGS AND SUBSEQUENTLY THE BEARING SEATS IN THE FRAME WILL BE DESTROYED.

The steering head bearings should be regreased at least once a year (e.g. Motorex Long Therm 2000).





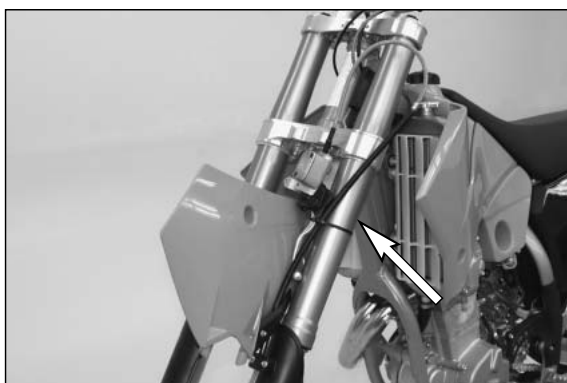
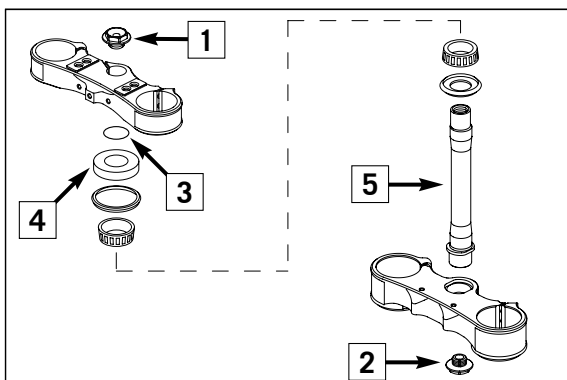
Changing the fork offset (caster) (SX) *

The fork offset [A] in the SX models (center fork legs - center steering head angle) can be set to either 18 or 20 mm. This allows you to optimize the handling to match the race course.

Remove the blind screw [1] to see which offset is set. If the mark [B] is in front, the offset is 18 mm. This setting will deliver more directional stability on fast race courses.

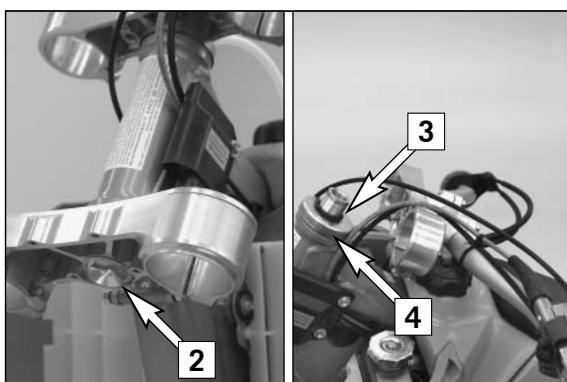
If the mark [B] is in the rear as illustrated, the offset is 20 mm. This setting will deliver better handling in curves.

The offset is set to 20 mm in the condition at delivery.



To adjust the offset, dismount the front wheel and remove the front wheel fender.

Remove the screw on the starting number plate. Remove the clamp screws on the hand brake cylinder and fasten the hand brake cylinder to the left fork leg with a cable tie to keep the brake line from kinking (see illustration).

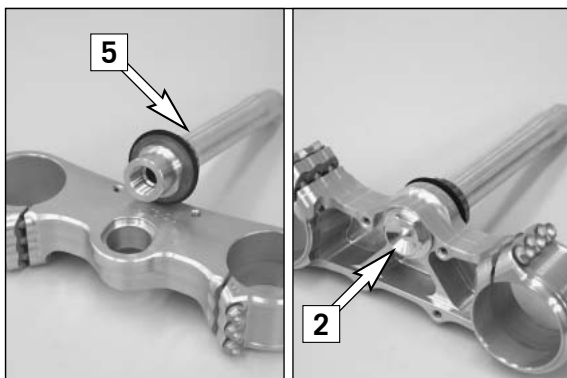


Loosen the clamp screws and take the fork legs out of the triple clamps.

Loosen the collar screw [2] on the lower triple clamp 2 turns.

Remove the blind screw [1] from the upper triple clamp, loosen the clamp screw and upper triple clamp on the seat. Remove the O-ring [3] and the protection ring [4].

Tap gently on the lower triple clamp with a rubber hammer to loosen the steering stem [5] out of the bearing seat. Take the lower triple clamp with the steering stem out of the steering head.



Remove the collar screw from the lower triple clamp and pull out the steering stem. Thoroughly clean all parts. Turn the steering stem 180° and insert it in the triple clamp, tighten the collar screw all the way to the stop.

⚠ WARNING

- A PLASTIC INSERT IN THE COLLAR SCREW THREAD MAKES THE COLLAR SCREW SELF-LOCKING. REPLACE IF THE COLLAR SCREW CAN BE SCREWED IN BY HAND.
- DO NOT CONFUSE THE COLLAR SCREW WITH THE BLIND SCREW. THE COLLAR SCREW IS SELF-LOCKING.

Grease the steering head bearing and sealing elements.

MAINTENANCE WORK ON CHASSIS AND ENGINE »

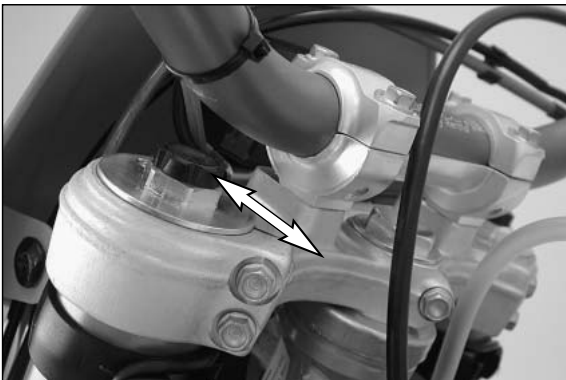


Mount the lower triple clamp, upper steering head bearing, protection ring, O-ring, upper triple clamp and the blind screw.
Tighten the collar screw on the lower triple clamp to 80 Nm.
Mount the fork legs and tighten the clamp screws on the lower triple clamp to 10 Nm in 3 stages.

Adjust the steering head bearing without clearance (see: Checking and adjusting the steering head support) and tighten the clamp screws on the upper triple clamp to 15 Nm in 3 stages.



Mount the front wheel fender and tighten the screws to 10 Nm.
Mount the hand brake cylinder and tighten the screws to 10 Nm.
Mount the starting number plate.
Mount the front wheel (see: Dismounting and mounting the front wheel).



Checking and adjusting the steering head bearing *

Check steering head bearing for play periodically. To check, put the motorcycle on a stand so that the front wheel is off the ground. Now try to move the fork forward and backward. For readjusting, loosen the five pinch bolts [1] of the top triple clamp and turn steering stem bolt [2] clockwise until there is no more play. Don't tighten the steering stem bolt all the way, otherwise the bearings will be damaged. With a plastic hammer, lightly tap on the triple clamp to release tension. Retighten the five pinch bolts to 15 Nm (SX) / 20 Nm (EXC, MXC).

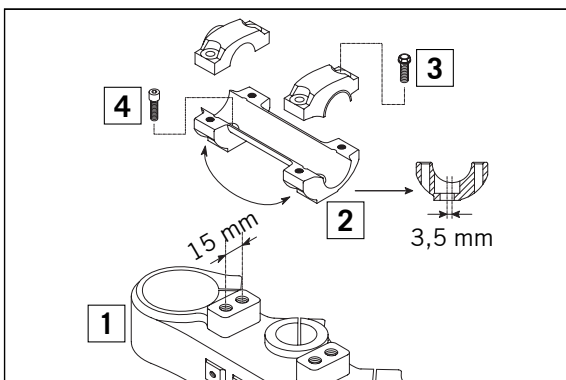
⚠ WARNING

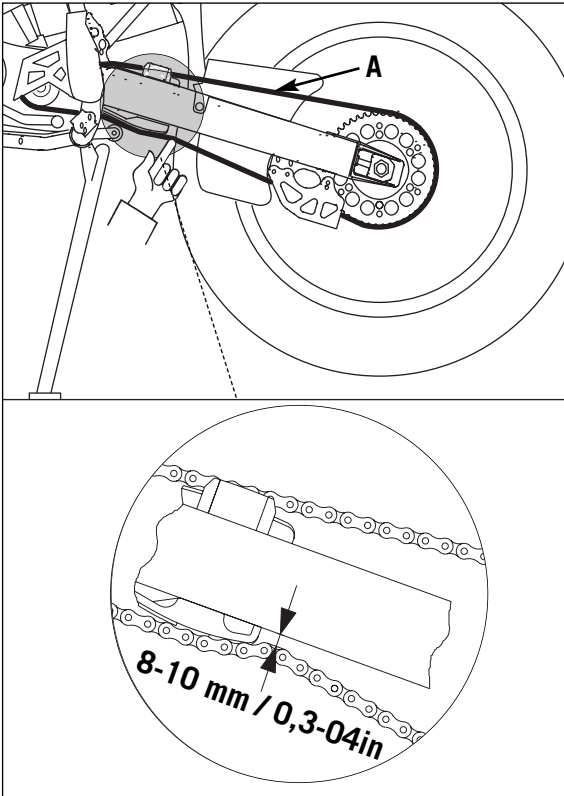
IF THE STEERING HEAD BEARING IS NOT ADJUSTED TO BE FREE OF PLAY, THE MOTORCYCLE WILL EXHIBIT UNSTEADY DRIVING CHARACTERISTICS AND CAN GET OUT OF CONTROL.

! CAUTION

IF YOU DRIVE WITH PLAY IN THE STEERING HEAD BEARING FOR LONGER PERIODS, THE BEARINGS AND SUBSEQUENTLY THE BEARING SEATS IN THE FRAME WILL BE DESTROYED.

The steering head bearings should be regreased at least once a year (e.g. Motorex Long Therm 2000).





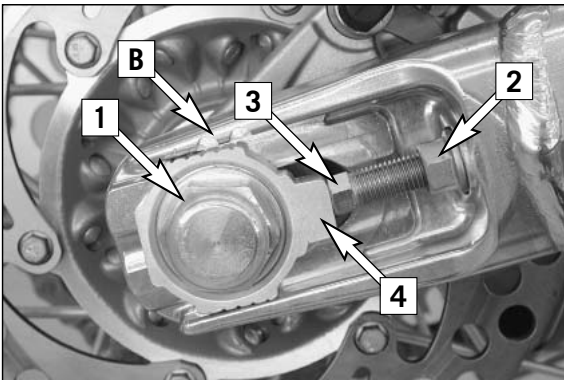
Check chain tension

Jack the motorcycle up on its frame so that the rear wheel no longer touches the ground.

Press the chain upward at the end of the chain sliding component. The distance between the chain and the swing arm should be approx. 8 - 10 mm (0.31 - 0.39 in). In the course of this procedure, the upper chain portion **[A]** must be taut (see drawing). If necessary, correct the chain tension.

⚠ WARNING

- EXCESSIVE TENSIONING OF THE CHAIN WILL PUT ADDITIONAL LOAD ON THE COMPONENTS OF THE SECONDARY DRIVETRAIN (CHAIN, BEARINGS OF TRANSMISSION AND REAR WHEEL). ASIDE FROM RESULTING PREMATURE WEAR, IF WORST COMES TO WORST THE CHAIN MAY RUPTURE OR THE COUNTERSHAFT OF THE TRANSMISSION MAY BREAK.
- TOO MUCH SLACK IN THE CHAIN, ON THE OTHER HAND, CAN RESULT IN THE CHAIN JUMPING OFF THE CHAIN WHEELS. IF THIS HAPPENS, THE CHAIN COULD ALSO BLOCK THE REAR WHEEL OR DAMAGE THE ENGINE.
- IN EITHER CASE THE OPERATOR IS LIKELY TO LOSE CONTROL OF THE MOTORCYCLE.



Correct chain tension

Loosen collar nut **[1]**, loosen lock nuts **[2]**, and turn right and left adjusting screws **[3]** equally far. Tighten lock nuts.

To ensure the correct alignment of the rear wheel, the marks at the left and right chain adjusters must be positioned identically in relation to the reference marks **[B]**. Tighten the counter nut of the adjusting screws.

Before tightening the collar nut, verify that the chain adjusters **[4]** are sitting close to the adjusting screws and that the rear wheel has been aligned with the front wheel.

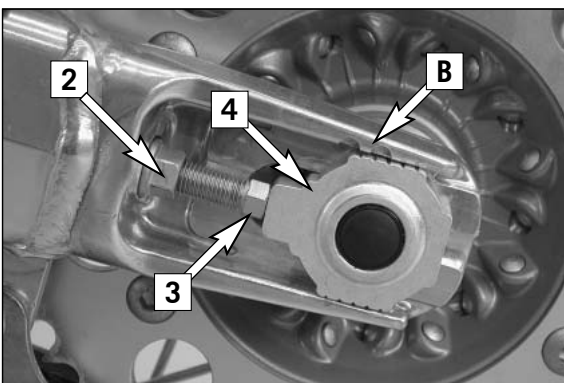
Tighten collar nut **[1]** to 80 Nm.

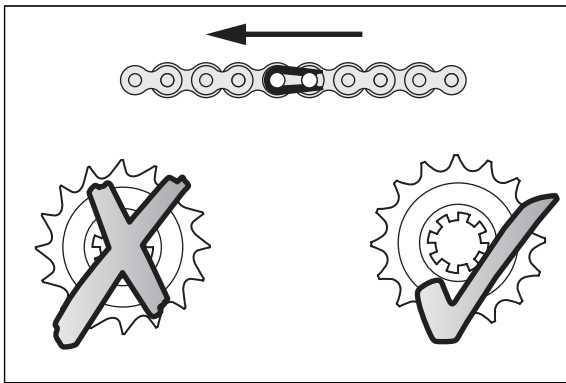
⚠ WARNING

- IF YOU DON'T HAPPEN TO HAVE A TORQUE WRENCH AT HAND, MAKE SURE YOU HAVE THE TIGHTENING TORQUE CORRECTED BY A KTM DEALER AS SOON AS POSSIBLE. A LOOSE AXLE MAY LEAD TO AN UNSTABLE DRIVING BEHAVIOR OF YOUR MOTORCYCLE.
- TIGHTEN THE COLLAR NUT WITH THE REQUIRED TORQUE. A LOOSE WHEEL SPINDLE MAY LEAD TO AN UNSTABLE BEHAVIOR OF YOUR MOTORCYCLE.

NOTE:

The large adjusting range of the chain adjusters (32mm) allows you to use different secondary ratios in combination with the same chain length. The chain adjusters **[4]** can be rotated by 180°.





Chain maintenance

For a long chain life, good maintenance is very important. Chains without X-rings should be cleaned in fireproof solvent regularly and afterwards treated with hot grease or chain spray (e.g. Motorex Chainlube 622).

X-ring chains on the other hand are very simple to clean. The best way is to use lots of water, but never use brushes or cleaning liquids. After letting the chain dry, you can use a special X-ring chain spray (e.g. Motorex Chainlube 622).

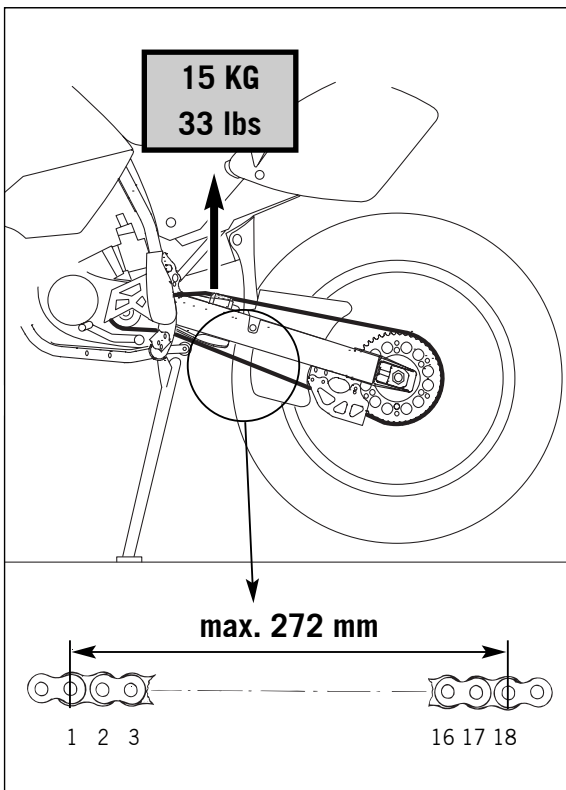
⚠ WARNING

NO LUBRICATION IS ALLOWED TO REACH THE REAR TIRE OR THE BRAKE DISKS, OTHERWISE THE ROAD ADHERENCE AND THE REAR WHEEL BRAKING EFFECTS WOULD BE STRONGLY REDUCED AND THE MOTORCYCLE COULD EASILY LOSE CONTROL.

! CAUTION

WHEN MOUNTING THE CHAIN MASTERLINK CLIP, THE CLOSED SIDE OF THE MASTERLINK CLIP MUST POINT IN RUNNING DIRECTION.

Also check sprockets and chain guides for wear and replace if necessary.



Chain wear

To check the chain wear, observe the following indications:

Shift the gear into idling and pull the upper chain strand with approx. 10-15 Kilograms (33 lb) upwards (see figure). Now one can measure a space of 18 chain reels at the lower chain strand. The chain should be replaced at the latest when a space of 272 mm (10.70 in) is measured. Chains do not always wear off evenly, therefore repeat the measurement at different places on the chain.

NOTE:

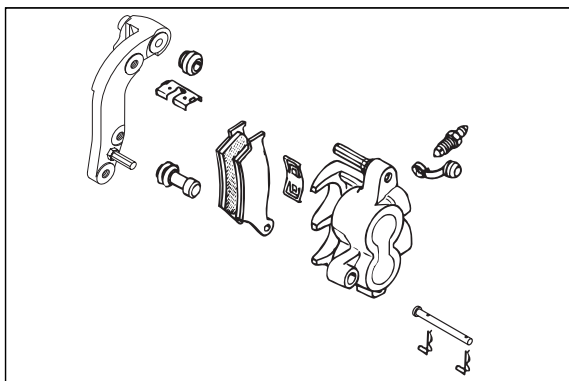
If you mount a new chain, the sprockets should also be replaced. New chains wear faster if used on old used sprockets.

! CAUTION

SECURE THE SCREWS OF THE CHAIN WHEEL BY APPLYING LOCTITE AND FASTEN THEM IN A CROSSWISE ORDER.

TIGHTENING TORQUE FOR NUTS: 35 NM.

TIGHTENING TORQUE FOR SCREWS: 50 NM.



General information about KTM disc brakes

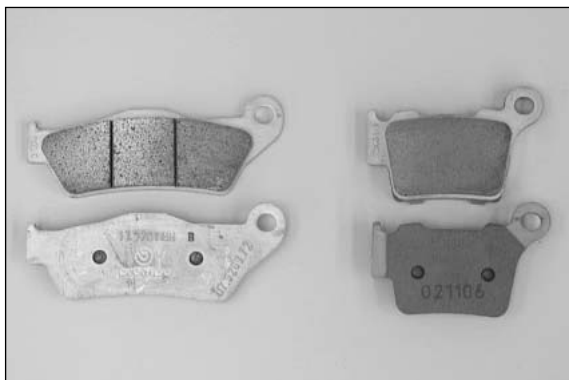
BRAKE CALIPERS:

The brake calipers of this series use a "floating" mount. This means that the brake calipers are not solidly attached to the caliper support, which enables them to "float" for maximum braking contact. Secure the screws of the caliper support with Loctite 243 and tighten to 25 Nm.

BRAKE PADS:

The brake pads are fitted with TOSHIBA TT 2701 sintered lining at the front and TOSHIBA H 38 sintered lining at the back. These linings provide an optimal combination of dosing, brake performance and life cycle. The lining type is stated on the back of the brake pad and also recorded in the homologation papers.

Other brake pads are available for competition sports.



FRONT: TOSHIBA H 38 (SINTERED) – harder to dose, good brake performance, long life, for wet slippery terrain.

FERODO ID 450 (ORGANIC) – easy to dose, good brake performance, short life, for dry terrain, low price

REAR: FERODO 4424 (organic) – better controllability, shorter service life, for dry terrain.

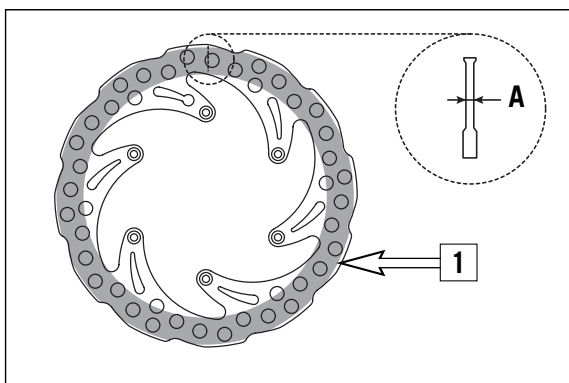
TOSHIBA H38 (Sinter) – longer service life than FERODO 4424, higher braking performance.

BRAKE DISCS:

Due to wear, the thickness of the brake disc in the area of the contact face [1] of the brake pads decreases. The brake disk must be at least 2.80 mm thick at the thinnest point [A]. Check the thickness of the brake disk at several points.

⚠ WARNING

- BRAKE DISCS SUFFERING FROM WEAR GREATER THAN 0,4 MM (0,016 IN) CONSTITUTE A SAFETY RISK. HAVE THE BRAKE DISCS REPLACED IMMEDIATELY AS SOON AS THEY REACH THE WEAR LIMIT.
- HAVE ANY REPAIRS ON THE BRAKE SYSTEM BE PERFORMED BY A KTM DEALER



BRAKE FLUID RESERVOIRS:

The brake fluid reservoirs on the front and rear wheel brakes have been designed in such a way that even if the brake pads are worn it is not necessary to top up the brake fluid. If the brake fluid level drops below the minimum level either the brake system has a leak or the brake pads are completely worn. In this case, consult an authorized KTM dealer immediately.

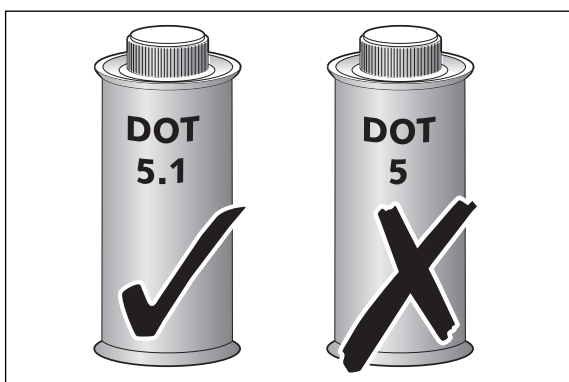
BRAKE FLUID:

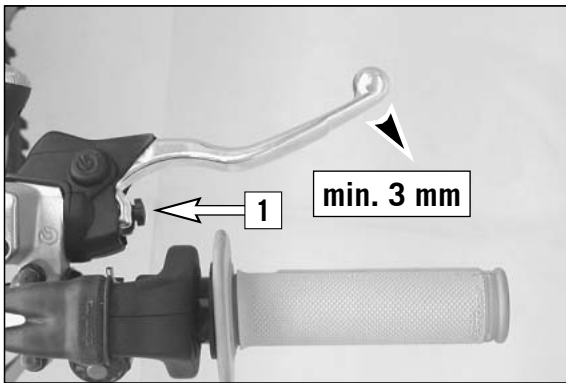
KTM fills the brake systems with Motorex Brake Fluid DOT 5.1 brake fluid, one of the best brake currently available. We recommend that you continue to use it. DOT 5.1 brake fluid is based on glycol ether and of an amber color. If you do not have any DOT 5.1 for refilling, you may use DOT 4 brake fluid. However, you should replace it as soon as possible with DOT 5.1.

Never use brake fluid DOT 5. The color of this silicon oil-based product is purple red. The gaskets and brake hoses of KTM motorcycles are not designed for DOT 5 brake fluid.

⚠ WARNING

HAVE THE BRAKE FLUID CHANGED AT LEAST ONCE ANNUALLY. IF YOU WASH YOUR MOTORCYCLE OFTEN, THE BRAKE FLUID SHOULD BE CHANGED EVEN MORE FREQUENTLY. BRAKE FLUID TENDS TO ABSORB WATER. THEREFORE, VAPOR POCKETS MAY FORM IN "OLD" BRAKE FLUIDS EVEN AT LOW TEMPERATURES, CAUSING THE BRAKE SYSTEM TO FAIL.





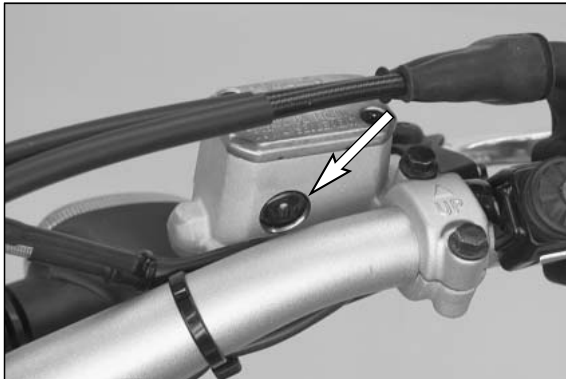
Adjusting the free travel at the hand brake lever

Free travel at the hand brake lever may be readjusted by using adjustment screw [1]. In this way, the position of the point of pressure (i.e. the resistance you feel on the hand brake lever when the brake pads are pressed against the brake disc) can be adjusted for any hand size.

When you press the hand brake lever forwards, you should have at least 3 mm free travel. Turn the adjusting screw [1] if necessary.

! CAUTION

AT THE HAND BRAKE LEVER, FREE TRAVEL MUST AT LEAST BE 3 mm (0.1 in). ONLY THEN MAY THE PISTON IN THE HAND BRAKE CYLINDER BE MOVED (TO BE RECOGNIZED BY THE GREATER RESISTANCE OF THE HAND BRAKE LEVER). IF THIS FREE TRAVEL IS NOT PROVIDED, PRESSURE WILL BUILD UP IN THE BRAKING SYSTEM, AND THE FRONT-WHEEL BRAKE MAY FAIL DUE TO OVERHEATING.

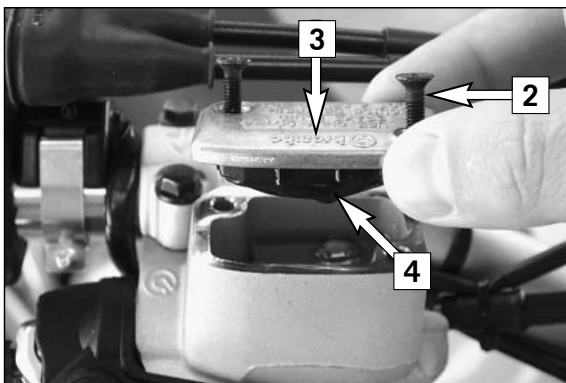


Checking the brake fluid level - front brake

The brake fluid reservoir is linked with the hand brake cylinder at the handlebar and the reservoir is provided with an inspection glass. With the reservoir in a horizontal position, the brake fluid level should not drop below the middle of the glass.

! WARNING

IF THE BRAKE FLUID LEVEL DROPS BELOW THE MINIMUM EITHER THE BRAKE SYSTEM HAS A LEAK OR THE BRAKE PADS ARE COMPLETELY WORN. IN THIS CASE, CONSULT AN AUTHORIZED KTM DEALER IMMEDIATELY.



Refilling the front brake fluid reservoir *

Loosen screws [2] and remove lid [3] and membrane [4].

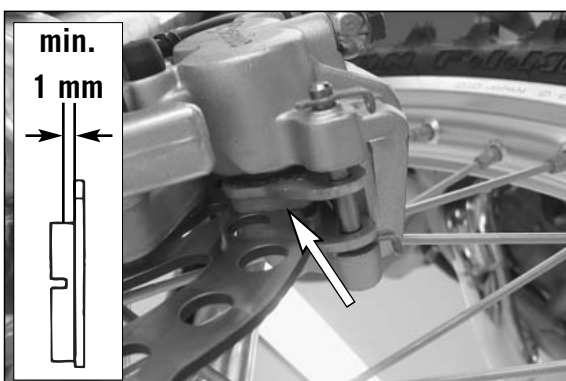
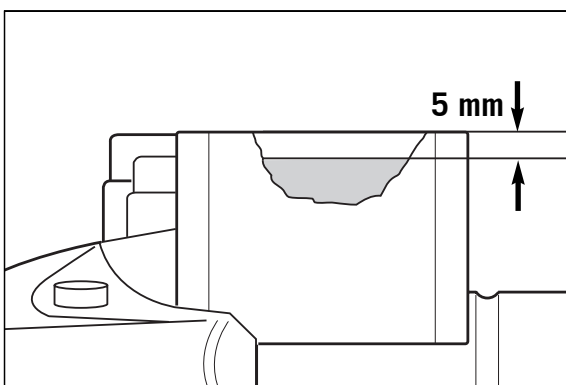
Place hand brake cylinder in a horizontal position and fill the brake fluid reservoir to 5 mm (0.2 in) below the rim with clean brake fluid DOT 5.1 (e.g. Motorex Brake Fluid DOT 5.1). Replace membrane and lid, tighten screws. Rinse off spilled or overflowing brake fluid with water.

! WARNING

- NEVER USE DOT5 BRAKE FLUID! IT IS BASED ON SILICONE OIL AND OF A PURPLE COLOR. SEALS AND BRAKE HOSES MUST BE ESPECIALLY ADAPTED TO IT.
- STORE BRAKE FLUID OUT OF REACH OF CHILDREN.
- BRAKE FLUID CAN CAUSE SKIN IRRITATION. AVOID CONTACT WITH SKIN AND EYES. IF YOU GET BRAKE FLUID IN YOUR EYES, RINSE WITH PLENTY OF WATER AND CONSULT A DOCTOR

! CAUTION

- DON'T LET BRAKE FLUID GET IN CONTACT WITH PAINT, IT IS AN EFFECTIVE PAINT REMOVER.
- USE ONLY CLEAN BRAKE FLUID TAKEN FROM A TIGHTLY SEALED CONTAINER.



Checking the front brake pads

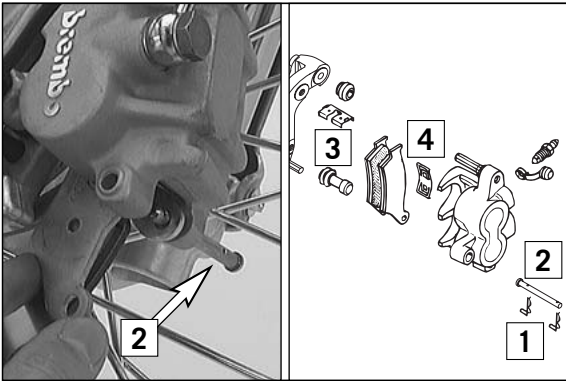
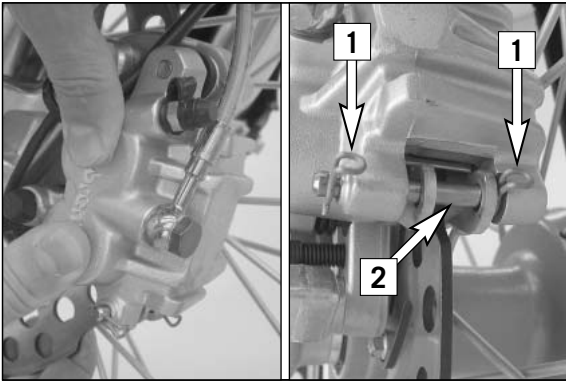
The brake pads can be inspected from below. The linings must be at least 1 mm (0.04 in) thick.

! WARNING

AT THEIR MOST WORN POINT BRAKE PAD LININGS SHOULD NOT BE THINNER THAN 1 mm, OTHERWISE THEY COULD LEAD TO BRAKE FAILURE. FOR YOUR OWN SAFETY DON'T PUT OFF HAVING YOUR BRAKE PADS CHANGED.

! CAUTION

IF THE BRAKE PADS ARE REPLACED TOO LATE SO THAT THE LINING IS PARTLY OR ENTIRELY WORN, THE STEEL COMPONENTS OF THE BRAKE PAD WILL RUB AGAINST THE BRAKE DISC, THEREBY IMPAIRING THE BRAKING EFFECT AND DESTROYING THE BRAKE DISC.



Replacing the front brake pads *

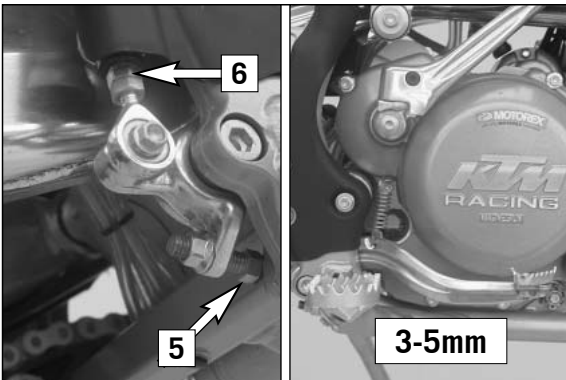
Press the brake caliper toward the brake disk, to put the brake piston in its basic position. Remove clips [1] and pull out bolt [2]. Remove brake pads from the brake caliper. Clean the brake caliper and the brake caliper support with compressed air. Check the sleeves of the guide bolts for damage, and grease guide bolts if necessary.

Mount the right brake pad and fix it with the bolt. Mount the left brake pad and insert the bolt until it stops. Mount the clips.

When mounting the brake pads, be sure to check for correct fit of the sliding metal-sheet [3] in the caliper support and of the leaf spring [4].

⚠ WARNING

- IT IS VERY IMPORTANT TO KEEP THE BRAKE DISK FREE FROM OIL AND FATTY MATTERS. OTHERWISE, THE BRAKING EFFECT WOULD BE STRONGLY REDUCED.
- AFTER ASSEMBLY, CHECK IF CIRCLIPS HAVE BEEN FITTED CORRECTLY.
- AFTER WORKING ON THE BRAKING SYSTEM, ALWAYS ACTUATE THE HAND BRAKE LEVER OR FOOT BRAKE LEVER, RESPECTIVELY TO ENSURE THAT THE BRAKE PADS WILL LIE AGAINST THE BRAKE DISK AND THE PRESSURE POINT IS ESTABLISHED.



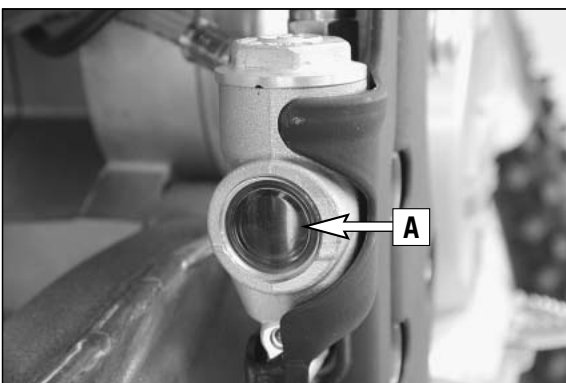
Changing the basic position of the foot brake pedal *

The basic position of the foot brake pedal can be altered by turning the stop screw [5]. The free play at the foot brake pedal must then be adjusted by means of the piston rod [6].

Measured on the outside, the foot brake pedal must have 3-5 mm (0.12–0.20 in) of free play before the piston rod can move the piston in the brake cylinder (to be recognised from the resistance on the foot brake pedal).

⚠ WARNING

IF THIS FREE PLAY IS NOT PRESENT, THEN PRESSURE CAN BUILD UP IN THE BRAKE SYSTEM WHEN DRIVING, CAUSING THE REAR WHEEL TO BRAKE. THE BRAKING SYSTEM OVERHEATS AND MAY EVEN FAIL COMPLETELY IN EXTREME CASES.



Checking the rear brake fluid level

The reservoir for the rear brake disk is located on the right side of the motorcycle on the rear brake cylinder.

No air bubble should be visible in inspection glass [A] when the vehicle is parked in a vertical position.

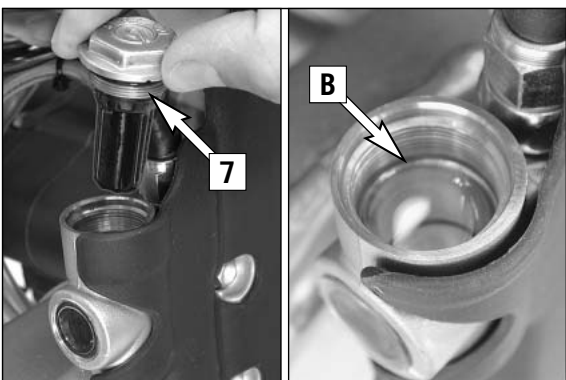
⚠ WARNING

IF THE BRAKE FLUID LEVEL DROPS BELOW THE MINIMUM EITHER THE BRAKE SYSTEM HAS A LEAK OR THE BRAKE PADS ARE COMPLETELY WORN. IN THIS CASE, CONSULT AN AUTHORIZED KTM DEALER IMMEDIATELY.

Refilling the rear brake fluid reservoir *

Add brake fluid as soon as a bubble is visible in inspection glass [A].

To top up, remove screw [7]. Fill DOT5.1 brake fluid (e.g. Motorex Brake Fluid DOT 5.1) up to the mark [B] on the inside of the reservoir and remount the screw. Spilled brake fluid must be rinsed off with water.

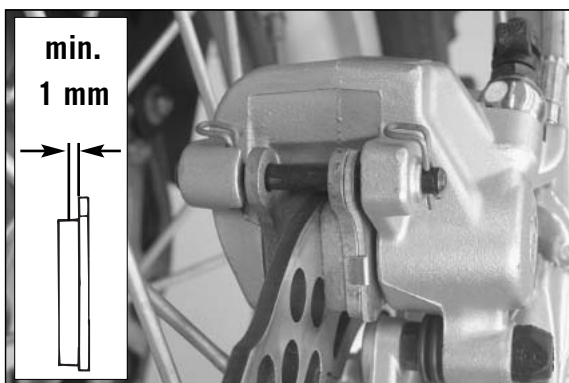


⚠ WARNING

- NEVER USE DOT5 BRAKE FLUID! IT IS BASED ON SILICONE OIL AND OF A PURPLE COLOR. SEALS AND BRAKE HOSES MUST BE ESPECIALLY ADAPTED TO IT.
- STORE BRAKE FLUID OUT OF REACH OF CHILDREN.
- BRAKE FLUID CAN CAUSE SKIN IRRITATION. AVOID CONTACT WITH SKIN AND EYES. IF YOU GET BRAKE FLUID IN YOUR EYES, RINSE WITH PLENTY OF WATER AND CONSULT A DOCTOR.

! CAUTION

- DON'T LET BRAKE FLUID GET IN CONTACT WITH PAINT, IT IS AN EFFECTIVE PAINT REMOVER.
- USE ONLY CLEAN BRAKE FLUID TAKEN FROM A TIGHTLY SEALED CONTAINER.



Checking the rear brake pads

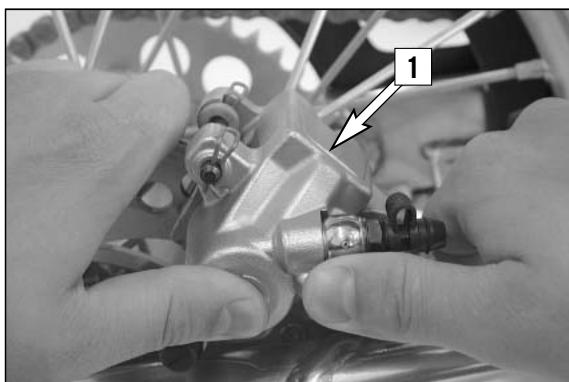
The brake pads can be inspected from the rear. The thickness of the linings may not be less than 1 mm (0.04 in).

⚠ WARNING

AT THEIR MOST WORN POINT BRAKE PAD LININGS SHOULD NOT BE THINNER THAN 1 MM, OTHERWISE THEY COULD LEAD TO BRAKE FAILURE. FOR YOUR OWN SAFETY DON'T PUT OFF HAVING YOUR BRAKE PADS CHANGED.

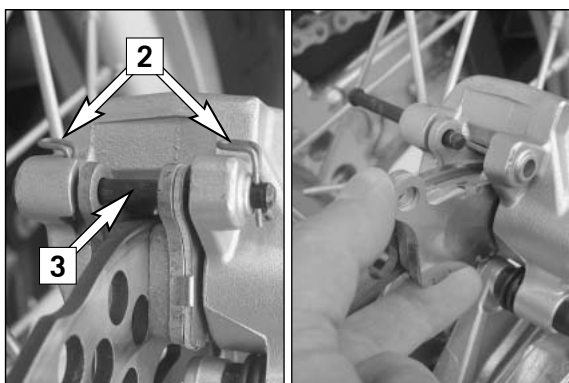
! CAUTION

IF THE BRAKE PADS ARE REPLACED TOO LATE SO THAT THE LINING IS PARTLY OR ENTIRELY WORN, THE STEEL COMPONENTS OF THE BRAKE PAD WILL RUB AGAINST THE BRAKE DISC, THEREBY IMPAIRING THE BRAKING EFFECT AND DESTROYING THE BRAKE DISC.



Replacing the rear brake pads *

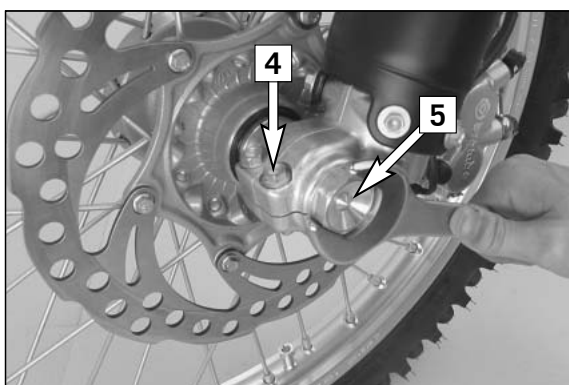
Push the brake caliper [1] toward the chain wheel in order to move the brake piston into its basic position. Remove the clips [2], pull out the bolt [3], and remove the brake pads. Thoroughly clean the brake caliper with compressed air and check the sleeves of the guide bolts for damage.



Insert the left brake pad into the brake caliper and secure it with the bolt. Insert the right brake pad and push the bolt [3] into the brake caliper up to the stop. Reattach clips [2].

⚠ WARNING

- IT IS VERY IMPORTANT TO KEEP THE BRAKE DISK FREE FROM OIL AND FATTY MATTERS. OTHERWISE, THE BRAKING EFFECT WOULD BE STRONGLY REDUCED.
- AFTER ASSEMBLY, CHECK IF CLIPS HAVE BEEN FITTED CORRECTLY.
- AFTER WORKING ON THE BRAKING SYSTEM, ALWAYS ACTUATE THE HAND BRAKE LEVER OR FOOT BRAKE LEVER, RESPECTIVELY TO ENSURE THAT THE BRAKE PADS WILL LIE AGAINST THE BRAKE DISK AND THE PRESSURE POINT IS ESTABLISHED.



Dismounting and mounting the front wheel

To remove the front wheel, jack the motorcycle up on its frame so that the front wheel no longer touches the ground.

Loosen the 2 clamping screws [4] on the left side of the fork fists.

Loosen and remove the collar nut [5], loosen the clamping screws [6] on the right side of the fork fist.

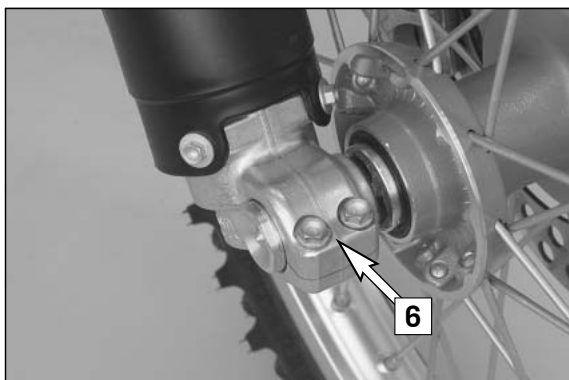
Hold the front wheel, pull out the wheel spindle [7].

NOTE: The wheel spindle can be easily removed if you slightly revolve it with a ring spanner (SW 27 mm).

Carefully remove the front wheel from the fork.

! CAUTION

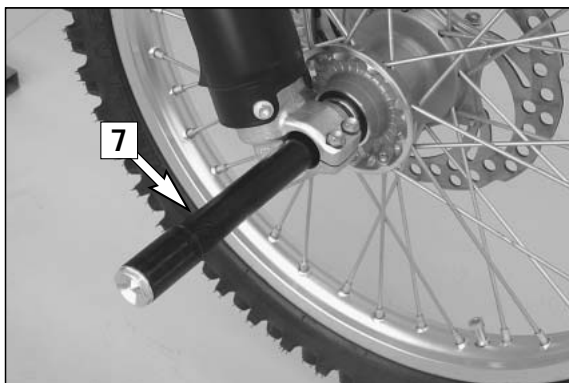
- DO NOT OPERATE THE HAND BRAKE WHEN THE FRONT WHEEL HAS BEEN DISMOUNTED.
- MAKE SURE THE BRAKE DISC IS ALWAYS ON TOP WHEN YOU LAY DOWN THE WHEEL, OTHERWISE THE BRAKE DISC CAN BE DAMAGED.



To install the front wheel, lift it into the fork, position and mount the axle shaft. Mount the collar nut [5], tighten the clamping screws [6] on the right fork leg axle passage to prevent the axle shaft from turning and tighten the collar nut to 40 Nm (30ft.lb).

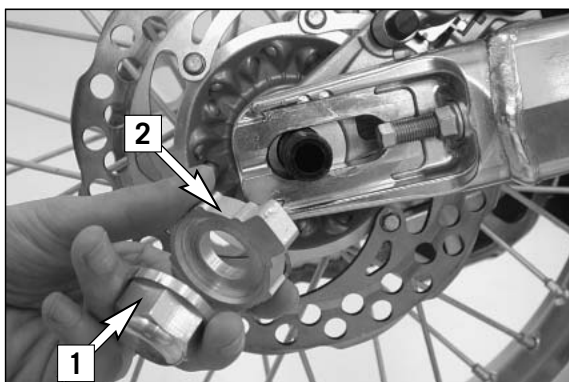
Loosen the clamp screws on the right fork leg. Take the motorcycle down from its stand. Press the front wheel brakes and push down on the fork a few times vigorously so that the fork legs come into alignment.

Only after this has been accomplished, tighten the clamp screws on both fork legs with 10 Nm (7 ft. lbs).



⚠ WARNING

- IF YOU DON'T HAPPEN TO HAVE A TORQUE WRENCH AT HAND, MAKE SURE YOU HAVE THE TIGHTENING TORQUE CORRECTED BY A KTM DEALER AS SOON AS POSSIBLE. A LOOSE AXLE MAY LEAD TO AN UNSTABLE DRIVING BEHAVIOR OF YOUR MOTORCYCLE.
- AFTER MOUNTING THE FRONT WHEEL, KEEP OPERATING THE HAND BRAKE UNTIL THE PRESSURE POINT RETURNS.
- IT IS VERY IMPORTANT TO KEEP THE BRAKE DISK FREE FROM OIL AND FATTY MATTERS, OTHERWISE THE BRAKING EFFECT WOULD BE STRONGLY REDUCED.



Dismounting and mounting the rear wheel

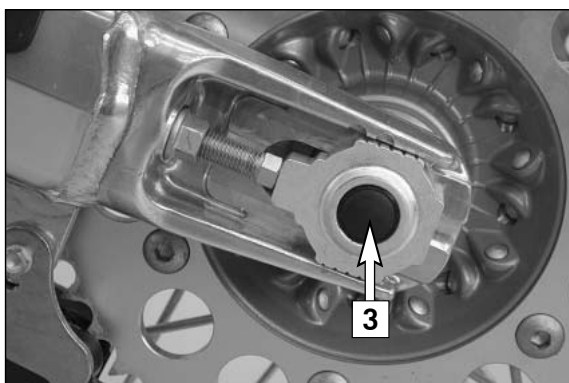
Jack the motorcycle up on its frame so that the rear wheel no longer touches the ground.

Loosen the collar nut [1], remove chain tensioner [2], hold the rear wheel and pull out the wheel spindle [3] until the rear wheel is free but the brake caliper support is still held.

Push the rear wheel as far forward as possible, take the chain from the chain wheel and carefully take the rear wheel out of the swingarm.

! CAUTION

- DO NOT OPERATE THE REAR BRAKE WHEN THE REAR WHEEL HAS BEEN DISMOUNTED.
- MAKE SURE THE BRAKE DISC IS ALWAYS ON TOP WHEN YOU LAY DOWN THE WHEEL, OTHERWISE THE BRAKE DISC CAN BE DAMAGED.
- IF THE AXLE IS DISMOUNTED, CLEAN THE THREAD OF THE WHEEL SPINDLE AND COLLAR NUT THOROUGHLY AND APPLY A NEW COAT OF GREASE TO PREVENT THE THREAD FROM JAMMING.



The rear wheel is remounted in the reverse order. Before tightening the collar nut to 80 Nm, push the rear wheel forwards so that the chain tensioners lie on the tension screws.

⚠ WARNING

- IF YOU DON'T HAPPEN TO HAVE A TORQUE WRENCH AT HAND, MAKE SURE YOU HAVE THE TIGHTENING TORQUE CORRECTED BY A KTM DEALER AS SOON AS POSSIBLE. A LOOSE AXLE MAY LEAD TO AN UNSTABLE DRIVING BEHAVIOR OF YOUR MOTORCYCLE.
- AFTER MOUNTING THE REAR WHEEL, KEEP OPERATING THE REAR BRAKE UNTIL THE PRESSURE POINT RETURNS.
- IT IS VERY IMPORTANT TO KEEP THE BRAKE DISK FREE FROM OIL AND FATTY MATTERS, OTHERWISE THE BRAKING EFFECTS WOULD BE STRONGLY REDUCED.
- TIGHTEN THE COLLAR NUT WITH THE REQUIRED TORQUE. A LOOSE WHEEL SPINDLE MAY LEAD TO AN UNSTABLE BEHAVIOR OF YOUR MOTORCYCLE.



Checking spoke tension

The correct spoke tension is very important for the stability of the wheels and thus for riding safety. A loose spoke causes the wheel to become unbalanced and before long other spokes will have come loose. Check spoke tension, especially on a new motorcycle, at regular intervals. For checking, tap on each spoke with the blade of a screwdriver (see photo). A clear tone must be the result. Dull tones are indicators of loose spokes. If necessary, have the spokes retightened and the wheel centered by a KTM dealer.

⚠ WARNING

- SPOKES CAN TEAR IF YOU CONTINUE TO RIDE WITH THEM LOOSE. THIS MAY LEAD TO AN UNSTABLE HANDLING OF YOUR MOTORCYCLE.
- EXCESSIVELY TENSIONED SPOKES MAY RUPTURE DUE TO LOCAL OVERLOADING. THE SPOKES MUST BE TENSIONED TO 5 NM.



Tires, air pressure

Tire type, tire condition, and air pressure level affect the way your motor-cycle rides and must therefore be checked whenever you are getting ready to go anywhere on your motorcycle.

- Tire size can be found in the technical specifications and in the homologation certificate
- Tire condition has to be checked every time you want to ride your motor-cycle. Before leaving, check tires for punctures and nails or other sharp objects that might have become embedded in them.
Refer to the specific regulations in your country for minimum tire tread requirements. We recommend you replace the tires at the latest when the tread is down to 2 mm (0.08 in).
- Tire pressure should be checked regularly on a “cold” tire. Proper pressure ensures optimum driving comfort and extends the life of your tires.

⚠ WARNING

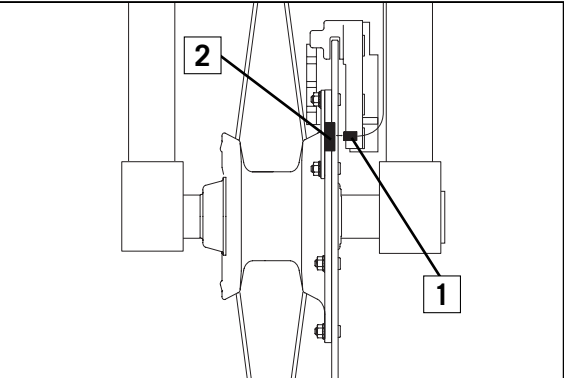
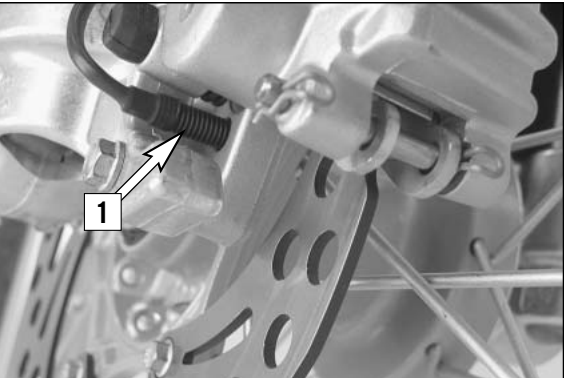
- DO NOT MOUNT TIRES WHICH HAVE NOT BEEN APPROVED BY KTM. OTHER TIRES COULD HAVE ADVERSE EFFECTS ON THE WAY YOUR MOTORCYCLE BEHAVES.
- FRONT AND REAR WHEELS MAY ONLY BE FITTED WITH TIRES HAVING THE SAME TREAD LAYOUT. USE HOMOLOGATED TIRES.
- FOR YOUR OWN SAFETY REPLACE DAMAGED TIRES IMMEDIATELY.
- WORN TIRES CAN HAVE A NEGATIVE EFFECT ON HOW YOUR MOTORCYCLE PERFORMS, ESPECIALLY ON WET SURFACES.
- IF AIR PRESSURE IS TOO LOW, ABNORMAL WEAR AND OVERHEATING OF THE TIRE CAN RESULT.

TIRES-AIR PRESSURE		
	front	rear
Off road	1,0 bar	1,0 bar
Road driver only	1,5 bar	2,0 bar

Check/set distance of the magnetic sensor

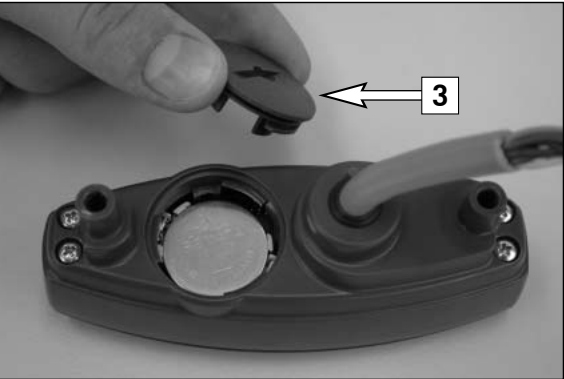
The distance between magnet [2] and sensor [1] must be 2-4 mm (0,08-0,16 in), otherwise malfunctions on the speedometer might occur.

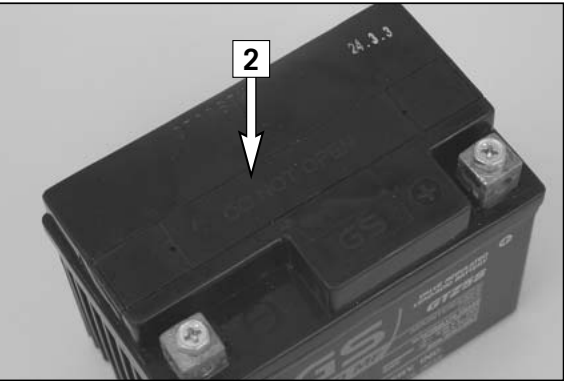
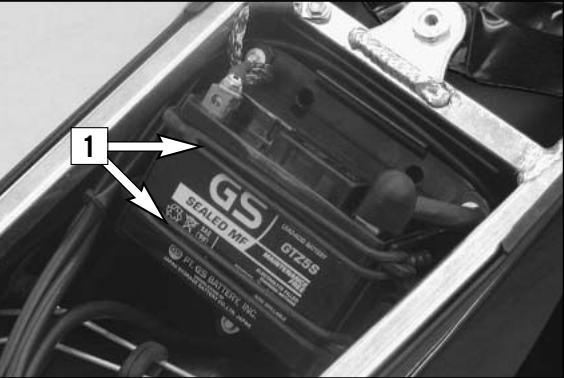
This distance can be corrected by screwing in or off the sensor [1].



Replacing the battery of the digital speedometer

Remove the headlight mask and disassemble the electronic speedometer. Remove the screw connection [3], insert the battery (type CR 2430) with the writing facing up and reinstall the screw connection.







Battery (MXC/EXC)

The battery is located under the seat and is maintenance-free. It is not necessary to check the electrolyte level or to refill water. Simply keep the battery poles clean and slightly grease them with an acid-free grease if necessary.

Removing the battery:
First disconnect the negative and then the positive pole of the battery. Remove the filter box cover and unhitch both rubber bands [1]. Remove battery. Install the battery with the terminals facing the front (see illustration), connecting the negative terminal post to the battery last.

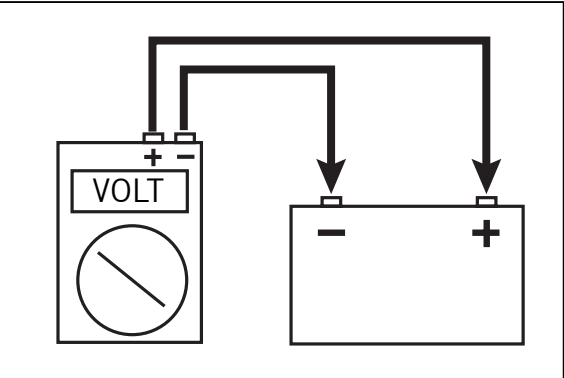
 **WARNING**

- IF ELECTROLYTE (SULPHURIC ACID) LEAKS FROM THE BATTERY, PROCEED WITH GREAT CARE. THE ELECTROLYTE CAN CAUSE SEVERE BURNS.
- IN THE CASE OF SKIN CONTACT RINSE THOROUGHLY WITH WATER.
- IN THE CASE OF CONTACT WITH THE EYES, THOROUGHLY RINSE EYES WITH WATER FOR AT LEAST 15 MINUTES. IMMEDIATELY CONSULT A DOCTOR.
- THE BATTERY IS A CLOSED MODEL BUT CAN NEVERTHELESS EMIT EXPLOSIVE GASES. AVOID SPARKS AND OPEN FIRE NEAR THE BATTERY.
- DEFECTIVE BATTERIES MUST BE STORED OUT OF THE REACH OF CHILDREN. ENSURE PROPER DISPOSAL OF DISCARDED BATTERIES.

 **CAUTION**

- TO AVOID DAMAGE, DO NOT REMOVE THE LOCKING BAR [2] !
- NEVER DISCONNECT THE BATTERY WHILE THE ENGINE IS RUNNING. THIS WILL DESTROY THE RECTIFIER-REGULATOR.
- THE BATTERY MUST BE INSTALLED WITH THE TERMINALS FACING THE FRONT (AS SHOWN IN THE ILLUSTRATION), OTHERWISE ELECTROLYTE CAN ESCAPE.

BATTERY STORAGE:
When preparing the motorcycle for a longer period of standstill, remove the battery and recharge it. Storage temperature: 0 - 35°C (30 - 95°F). Do not expose to direct sunlight.




Charging the battery

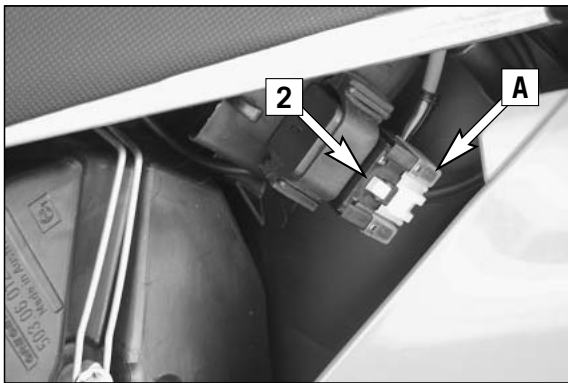
Remove the battery and check the charging level. Use a voltmeter to measure the voltage between the battery poles (off-load voltage). Accurate results can only be obtained if the battery has neither been charged nor discharged during a period of 30 minutes preceding the measuring.

off load voltage Volt	charging level %	charging time 0,4 A	charging voltage
>12,7	100	—	Max. 14,4 V
~12,5	75	4 h	
~12,2	50	7 h	
~12,0	25	11 h	
~11,8	0	14 h	

If the battery is empty, it can be recharged for a maximum period of 10 hours at 0.4 A and a maximum of 14.4 V.

 **CAUTION**

- TO AVOID DAMAGE, DO NOT REMOVE THE LOCKING BAR.
- ALWAYS CONNECT THE BATTERY TO THE CHARGING UNIT BEFORE TURNING THE CHARGING UNIT ON.
- WHEN RECHARGING THE BATTERY IN CLOSED ROOMS THERE IS SUFFICIENT VENTILATION. EXPLOSIVE GASES ARE RELEASED DURING THE BATTERY CHARGING PROCESS.
- CHARGING TIME AND CHARGING VOLTAGE SHOULD NOT EXCEED THE STATED VALUES. OTHERWISE ELECTROLYTE WILL BE RELEASED THROUGH THE SAFETY VALVES.
- AVOID QUICK CHARGING IF POSSIBLE.



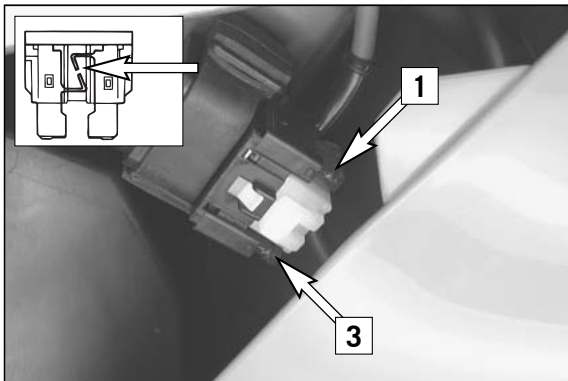
Fuse (MXC/EXC)

The fuse [1] is located in the starter relay of the E-starter [2] underneath the left side paneling.

Having removed the left side paneling, the air box cover and the protection cover [A], you will be able to see the fuse.

The following loads are connected to it:

- E-starter system
- horn
- flasher lights
- electronic speedometer



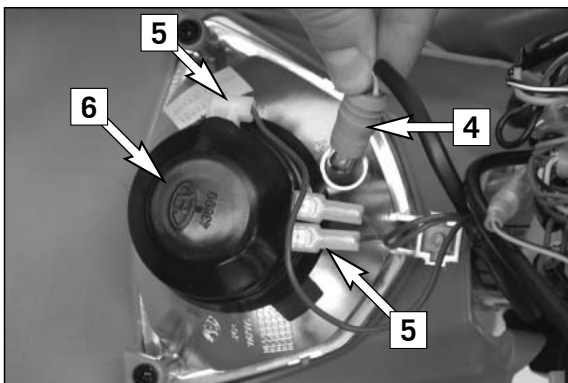
The starter relay also contains a (10 amp) spare fuse [3].

Replace a blown fuse only with an equivalent one. If a new fuse that has just been installed gets blown again, you are strongly advised to have it inspected by a KTM dealer.

The fuse capacity is 10 Ampere.

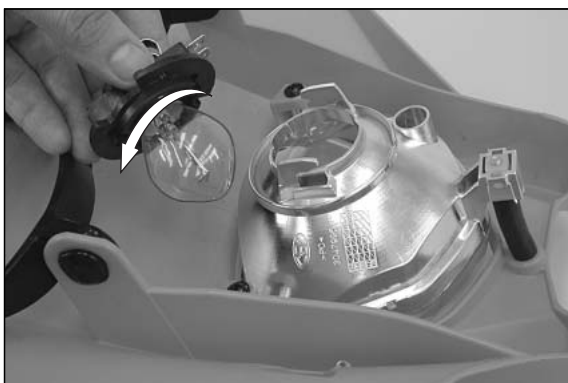
! CAUTION

UNDER NO CIRCUMSTANCES IS A STRONGER FUSE ALLOWED TO BE INSTALLED OR A FUSE ALLOWED TO BE "REPAIRED". AN IMPROPER TREATMENT COULD DAMAGE THE WHOLE ELECTRICAL INSTALLATION.



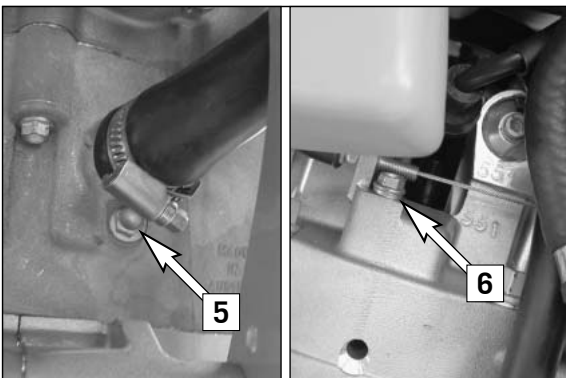
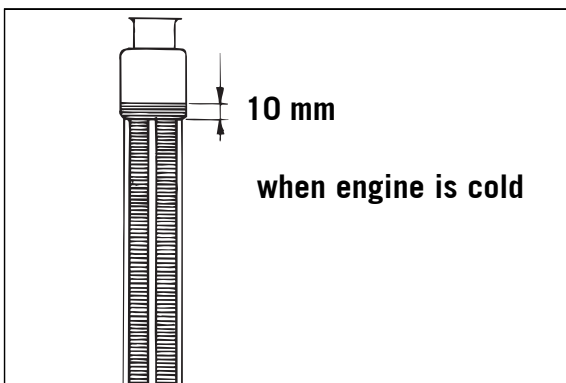
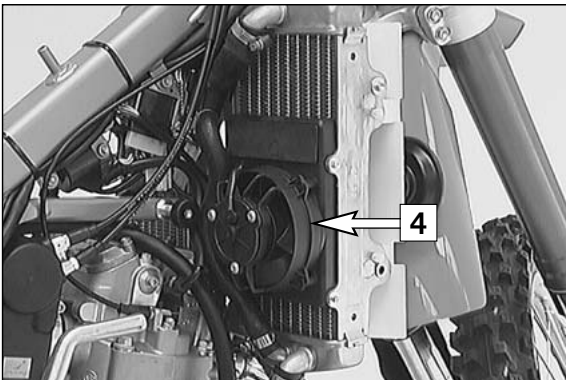
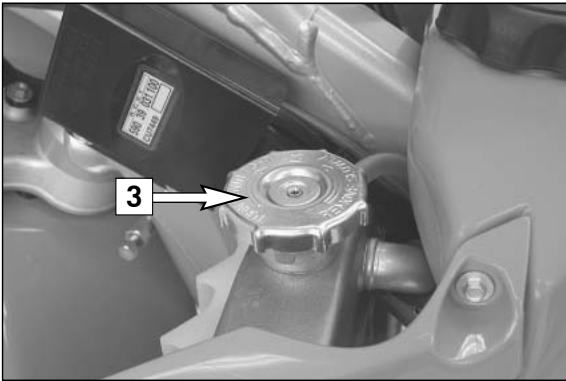
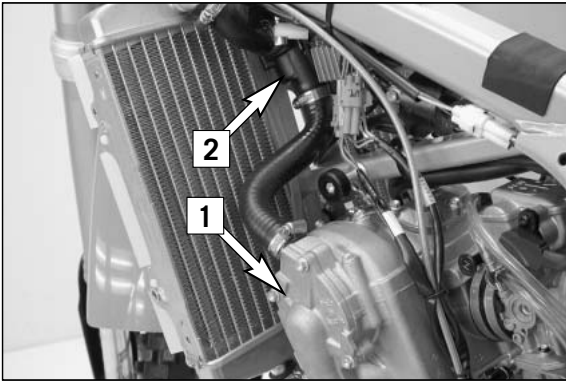
Replacing headlight lamp/parking light lamp

Loosen both rubber bands and tilt headlight mask to the front. Pull the parking light lamp with holder [4] carefully out of the reflector. Pull connector [5] off the headlamp and remove rubber cap [6]. Disengage retaining clip and take bulb out of reflector. When changing the parking-light lamp, simply pull it out of the holder.



Slightly depress the bulb, turn it approx. 30° counterclockwise and pull it out of the socket.

To mount the lamp reverse the worksteps indicated above.



Cooling system

Coolant is circulated by a water pump [1] located in the engine. When the engine is cold the coolant only circulates through the cylinder and the cylinder head. After the engine has reached its operating temperature (about 70°C, 158°F), the thermostat [2] opens and the coolant is also pumped through both aluminum radiators.

Air blowing in through the radiators cools the coolant. The slower the speed of the motorcycle, the less the coolant is cooled down. Dirty radiators also reduce the cooling efficiency.

Pressure induced by heating of the coolant in the system is controlled by a valve in the radiator cap [3]; a water temperature rising up to 120° C (248° F) is admissible, without fear of problems.

⚠ WARNING

- IF POSSIBLE, ALWAYS CHECK LEVEL OF COOLING LIQUID WHEN THE ENGINE IS COLD. IF YOU HAVE TO OPEN THE RADIATOR CAP [3] WHEN THE ENGINE IS HOT, USE A RAG TO COVER THE CAP AND OPEN SLOWLY TO RELEASE PRESSURE. CAUTION - SCALDING HAZARD.
- DO NOT DETACH ANY RADIATOR HOSES WHILE THE ENGINE IS HOT. THE ESCAPING HOT COOLANT AND THE STEAM MAY CAUSE SERIOUS BURNS.
- IN CASE YOU GET BURNT, HOLD THE AFFECTED PART OF YOUR BODY UNDER RUNNING COLD WATER RIGHT AWAY.
- COOLANT IS TOXIC. KEEP THE COOLANT OUT OF THE REACH OF CHILDREN.
- IN CASE COOLANT IS INGESTED, CONSULT A DOCTOR IMMEDIATELY.
- IF COOLANT GETS INTO YOUR EYES, RINSE THEM OUT WITH WATER IMMEDIATELY AND CONSULT DOCTOR.

A mixture of 50% antifreeze liquid and 50% water is used as coolant. However, the antifreeze protection must be at least -25° C (-13° F). This mixture offers antifreeze protection but also good corrosion protection and should therefore not be replaced by pure water.

! CAUTION

- THE COOLING SYSTEM MUST BE BLED AFTER DRAINING THE COOLING LIQUID OR AFTER ADDING MORE THAN 0.25 L (0.06 US GALLONS) COOLING LIQUID.(SEE BELOW).
- FOR THE COOLING SYSTEM, USE ONLY HIGH-GRADE ANTIFREEZE (E.G. MOTOREX ANTI FREEZE). USING LOWER-GRADE ANTIFREEZE AGENTS CAN CAUSE CORROSION AND COOLANT FOAMING.
- EXTREME CLIMATE CONDITIONS OR STOP AND GO TRAFFIC MAY CAUSE OVERHEATING PROBLEMS. TO AVOID THIS, AN ELECTRIC BLOWER [4] IS OFFERED FOR MODELS WITH ELECTRIC STARTERS (ASK YOUR KTM DEALER)

Checking the coolant level

The coolant should be 10 mm (0.4 in) above the radiator fins when the engine is cold (see diagram). In the event of the coolant being drained, always fill and bleed the system.

! CAUTION

IF POSSIBLE, ALWAYS CHECK THE LEVEL OF COOLING LIQUID WHEN THE ENGINE IS COLD. IF YOU HAVE TO OPEN THE RADIATOR CAP [3] WHEN THE ENGINE IS HOT, USE A RAG TO COVER THE CAP AND OPEN SLOWLY TO RELEASE PRESSURE.

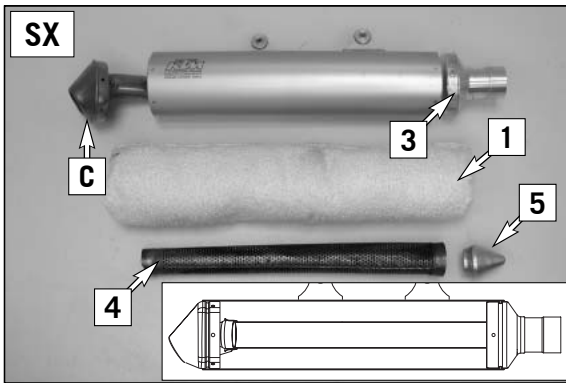
Bleeding the cooling system

By removing the screw [5] at the front end of the cylinder you can drain the coolant.

To bleed the cooling system, fill in approx. 0.8 liters (0.2 US gallons) of coolant and remove the bleeder screw [6]. Do not reinstall the bleeder screw until coolant escapes at the bore without any bubbles.

Then, fill in the coolant until it reaches a level about 10mm above the radiator fins.

After a short ride, check the coolant level once more.

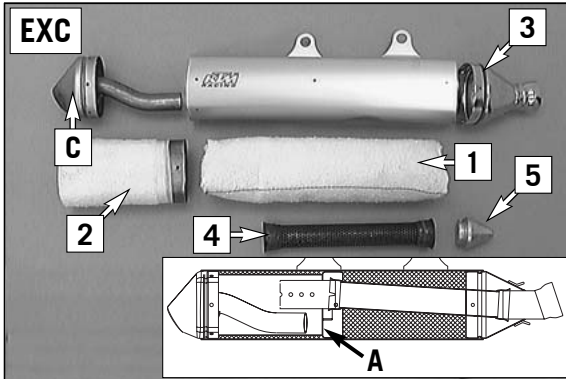


Replacing the glassfiber yarn packing of the silencer *

Aluminum silencers are filled with glassfiber yarn to muffle noise. The effect of heat causes the glassfiber yarn to become loose. This may lead to a loss of performance and reduce the silencer's muffling power. By experience, the front glassfiber yarn packing [1] needs to be replaced more often than the rear silencing mat [2].

For this purpose, remove the silencer from the vehicle and dismount the front cap [3]. Pull the front glassfiber yarn packing together with the inner exhaust pipe [4] out of the silencer. Clean the front inner exhaust pipe.

To facilitate the mounting procedure, you can make a mounting tool [5] out of wood, plastic, or metal. Insert the mounting tool into the inner pipe and mount the glassfiber packing. Push the inner pipe containing the packing into the silencer such that the slot engages the web [A]. Use a blunt ended object to stuff the glassfiber yarn packing all the way into the silencer, and mount the front cap [C].



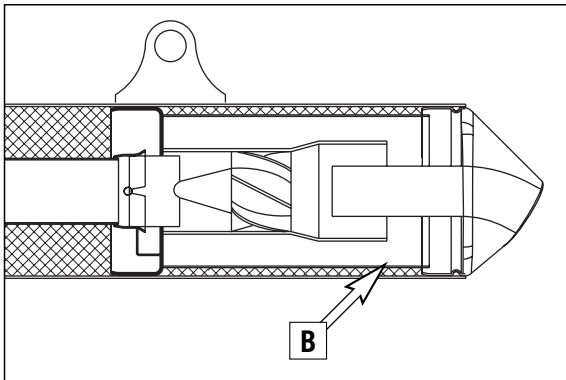
To change the rear silencing mat, start by removing the front packing and the inner exhaust pipe. Then, drill open the rivets and remove the end cap.

NOTE!

In every exhaust repair procedure, the O-rings must be replaced by new ones. Glass fiber yarn packings are available from your licensed KTM mechanic.

⚠ WARNING

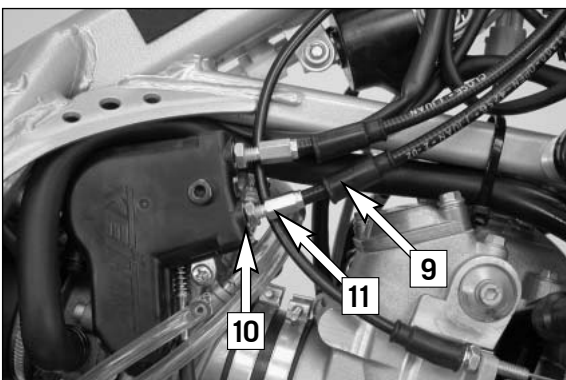
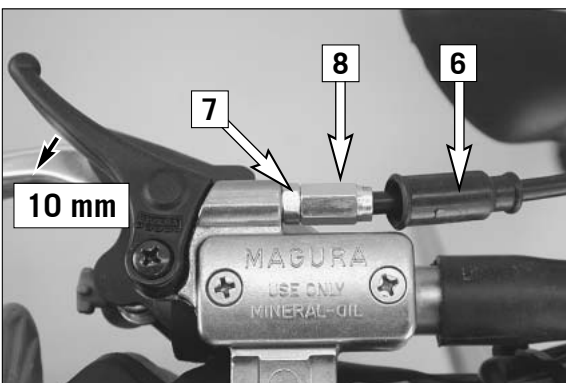
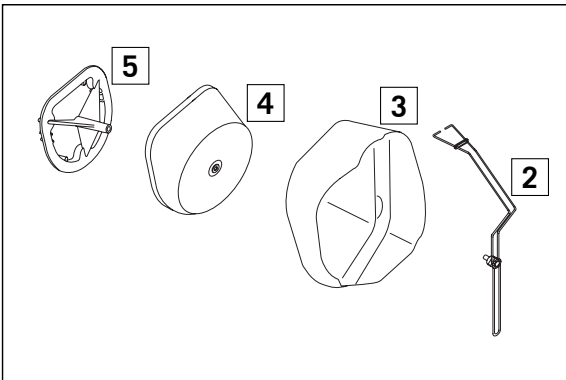
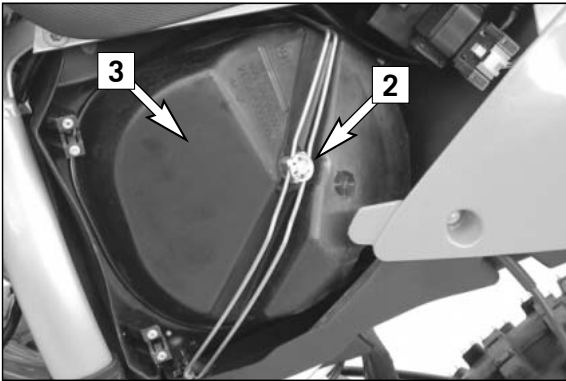
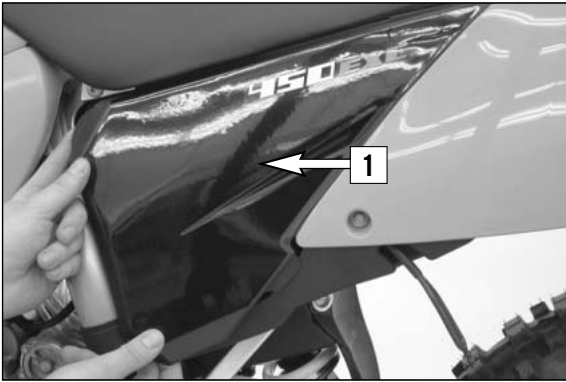
THE EXHAUST SYSTEM BECOMES VERY HOT WHILE THE MOTORCYCLE IS RUNNING. TO AVOID BURNS DO NOT START WORK ON THE EXHAUST SYSTEM UNTIL IT HAS PROPERLY COOLED DOWN.



Cleaning the spark arrester (MXC/EXC USA) *

The spark arrester should be cleaned every time the glassfiber yarn filling is changed or at least once annually.

For this purpose, dismount the silencer cap and remove any deposits that might exist in region [B]. Renew the O-ring and mount the silencer cap.



Cleaning the air filter *

The air filter must be cleaned prior to each race or whenever dust has accumulated. To clean, lift the filter box cover [1] (see illustration) and pull off towards the front. Detach the bottom of the filter retaining bracket [2], tilt aside and remove the throttle cap [3] and the air filter [4] and filter support [5] from the filter box. The SX models do not have a throttle cap.

! CAUTION

- DO NOT CLEAN FOAM FILTER WITH FUEL OR PETROLEUM SINCE THESE DAMAGE THE FOAM. KTM RECOMMENDS THE PRODUCTS OF THE COMPANY MOTOREX FOR AIR FILTER MAINTENANCE (BIO DIRT REMOVER AND LIQUID BIO POWER).
- NEVER START YOUR MOTORCYCLE WITHOUT ANY AIR FILTERS. OTHERWISE, DUST AND DIRT MAY PENETRATE AND CAUSE DAMAGE AND INCREASED WEAR.
- DUST AND DIRT CAN ACCUMULATE AND DAMAGE THE ENGINE IF THE AIR FILTER IS NOT MOUNTED CORRECTLY.

Thoroughly wash the air filter in special cleaning fluid and allow it to dry well. Only press out the filter, do not wring it out under any circumstances. Oil the dry air filter with a high-grade filter oil. Also clean the air filter box. Check the carburetor collar for damage and that it is filled correctly.

Mount the air filter on the filter support. Insert the air filter and filter support in the throttle cap and mount them in the filter box, aligning in a central position, and fix with the filter retaining bracket.

Checking the adjustment of the hand decompression release cable *

Start the engine and, at idling speed, slowly pull the hand decompression lever until you can feel the thumping of the rocker arm on the lever. The backlash until said thumping should be approx. 10mm, measured at the lever's outer end. If necessary, correct this backlash.

To adjust, move back the protective cover [6], loosen the counter nut [7] and correct the adjustment screw [8] accordingly. Tighten counter nut and push back protective cover.

! CAUTION

THE SETTING OF THE DECOMPRESSION CABLE SHOULD BE CHECKED REGULARY. IF THERE IS NO PLAY IN THE DEKO-LEVER, THIS CAN RESULT IN ENGINE DAMAGE.

note:

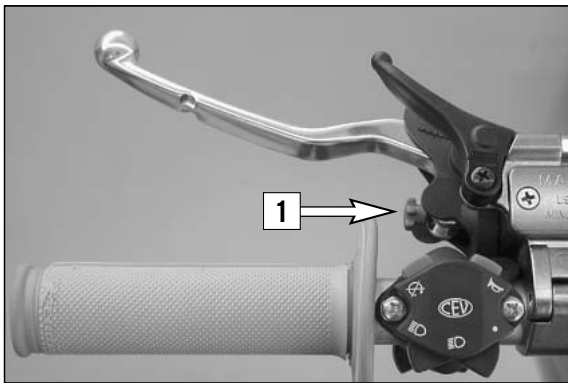
No adjustment need be made to the automatic decompressor.

Adjusting the throttle cables *

The throttle grip should always provide for a backlash of 3-5mm. Besides, with the engine running, the idling speed must not change if you turn the handlebar all the way to the left or right.

To adjust the throttle cables, dismount the seat and the tank together with spoilers. Slide back the protection cover [9]. Loosen the counternut [10] and turn the adjusting screw [11] accordingly. Turning the adjusting screw counterclockwise will reduce the backlash, turning the adjusting screw clockwise will increase the backlash.

Tighten the counternut and check whether the throttle grip can be actuated smoothly. Mount tank and seat.



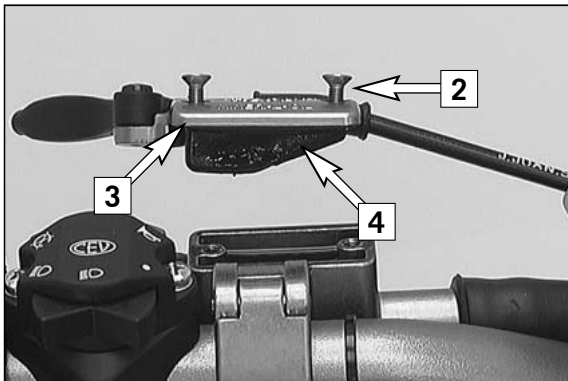
Changing the original position of the clutch lever

The adjusting screw [1] can be used for individual adjustment of the original position of the clutch lever, thus allowing adjustment to an optimal position for every hand size.

Turning the adjusting screw clockwise reduces the distance between the clutch lever and the handlebar. Turning the adjusting screw counterclockwise increases the distance between the clutch lever and the handlebar.

! CAUTION

ADJUSTMENT OF THE CLUTCH LEVER POSITION IS ONLY POSSIBLE WITHIN CERTAIN LIMITS. ONLY TURN THE ADJUSTING SCREW MANUALLY AND NEVER APPLY EXCESSIVE FORCE.



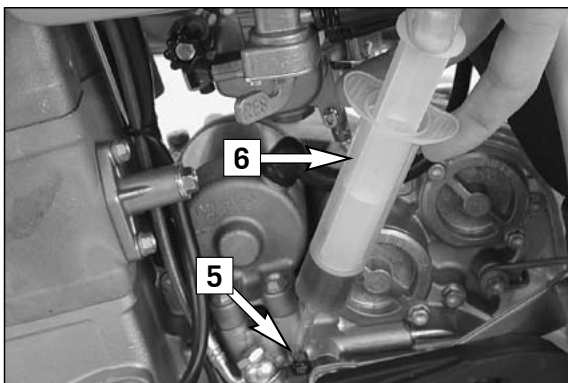
Checking the oil level of the hydraulic clutch

To check the oil level in the master cylinder of the clutch remove the cover. For this purpose, remove screws [2] and cover [3] together with the rubber boot [4]. The oil level in the horizontal-standing master cylinder should be 4 mm below the upper edge.

If necessary, fill up with biodegradable hydraulic oil SAE 10 (e.g. Motorex Kupplungs-Fluid 75). Biodegradable hydraulic oil is available from your KTM dealer (50ml).

! CAUTION

KTM USES BIODEGRADABLE HYDRAULIC OIL FOR THE HYDRAULIC CLUTCH CONTROL. NEVER MIX BIODEGRADABLE HYDRAULIC OILS WITH MINERAL OILS. NEVER REFILL WITH MINERAL HYDRAULIC OIL OR BRAKE FLUID.



Bleeding of the hydraulic clutch

If the clutch lever starts to feel unresponsive, the clutch control system needs to be bled. You will need a bleeder syringe (special tool) and biodegradable hydraulic oil. Both are available from your KTM dealer.

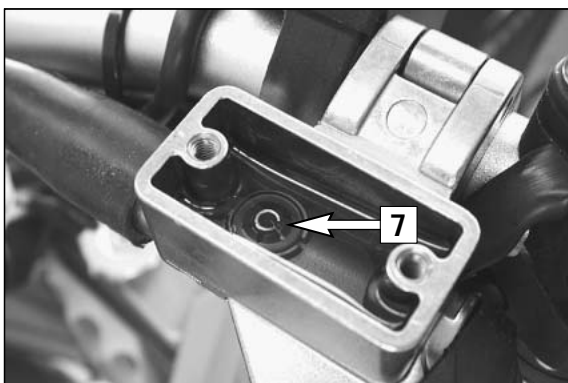
Turn the handlebar until the master cylinder is in a horizontal position, remove the screws [2], the cover [3] and the rubber boot [4].

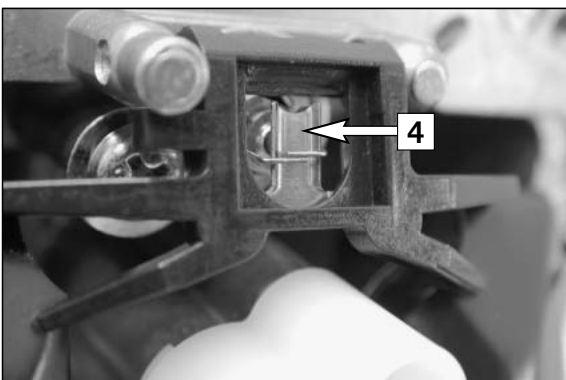
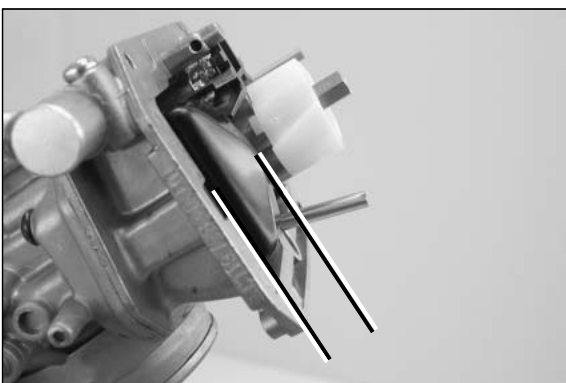
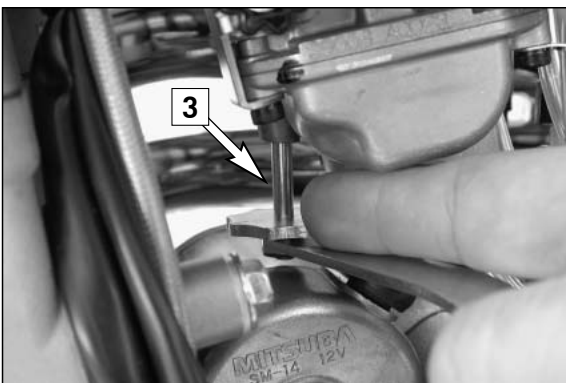
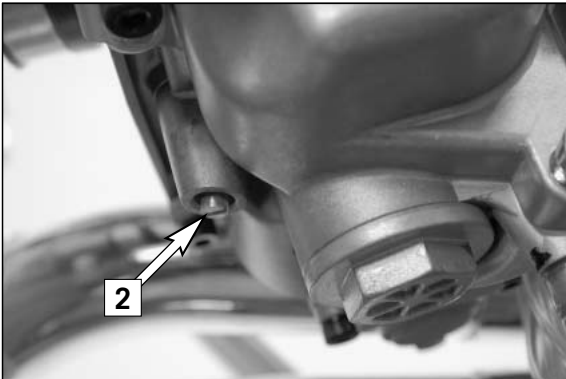
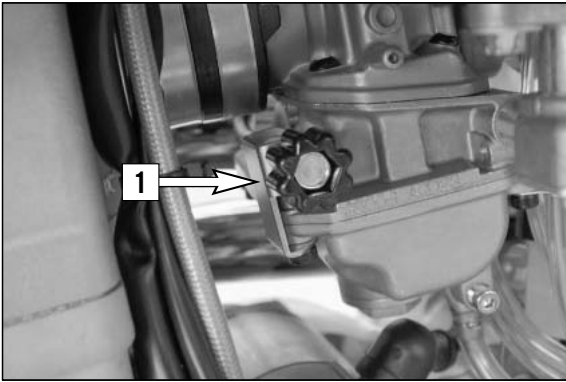
Fill the bleeder syringe [6] with biodegradable hydraulic oil (Motorex Kupplungs-fluid 75). Remove the bleeder screw [5] from the slave cylinder and mount the bleeder syringe. Press oil into the system until the oil runs out of the hole [7] in the master cylinder without bubbles. Occasionally extract the oil from the master cylinder reservoir to keep it from overflowing.

After you finish bleeding, remove the bleeder syringe, mount the bleeder screw, correct the oil level in the reservoir and mount the cover (see above).

! CAUTION

KTM USES BIODEGRADABLE HYDRAULIC OIL FOR THE HYDRAULIC CLUTCH CONTROL. NEVER MIX BIODEGRADABLE HYDRAULIC OILS WITH MINERAL OILS. NEVER REFILL WITH MINERAL HYDRAULIC OIL OR BRAKE FLUID.





CARBURETOR – Adjust idling (Keihin-FCRMX 37/39/41) *

Idling adjustment of the carburetor strongly affects the engine's starting behavior. That is, an engine whose idling speed is adjusted correctly will be easier to start than one whose idling speed has not been adjusted correctly.

The idle speed is controlled by means of the adjusting wheel [1] and the mixture control screw [2]. The adjusting wheel is used to adjust the basic setting of the slide. The mixture control screw is used to control the idle mixture which arrives at the engine by way of the idle system. Clockwise turning reduces the fuel quantity (lean mixture), counterclockwise turning increases the fuel quantity (rich mixture).

TO ADJUST IDLING CORRECTLY, PROCEED AS FOLLOWS:

- 1 Turn in mixture control screw [2] up to the stop, and turn it back out to the basic position (see technical data-engine)
 - 2 Warm up the engine
 - 3 Use the adjusting wheel [1] to set the normal idle speed (1400 - 1500 rpm).
 - 4 Turn mixture control screw [2] slowly clockwise until idling speed starts to decrease. Memorize this position, and turn mixture control screw slowly counterclockwise until the idling speed decreases again. Adjust the point of the highest idling speed between these two positions. If, in the course of this procedure, the speed undergoes a relatively high increase, reduce the idle speed to a normal level and repeat the procedure specified in 4. Serious competitive racers will choose a setting approx. 1/4 turn (clockwise) leaner than this ideal value because their engine will heat up more when used in competitions.
- NOTE: If you fail to obtain a satisfying result by following the procedure described above, an incorrectly dimensioned idling nozzle may be the cause. If:
- a) the mixture control screw has been screwed in up to the stop without causing any change in rotational speed, a smaller idling jet has to be installed;
 - b) the engine dies when the mixture control screw is still open by 2 turns, a larger idling jet needs to be selected.
- Naturally, in cases of jet changes, you have to start your adjusting work from the beginning.
- 5 Then, use the adjusting wheel to set the desired idle speed.
 - 6 In cases of greater changes in the outside temperature and extremely different altitudes, the idling speed should be readjusted.

Basic information on carburetor wear

As a result of engine vibrations, the throttle valve, jet needle, and needle jet are subjected to increased wear. This wear may cause the carburetor to malfunction (e.g., overly rich mixture). Therefore, these parts should be replaced after 200 hours.

Adjusting the mixture control screw *

Especially on the EXC models, accessing the mixture control screw is difficult. For this reasons, we have created an appropriate special tool.

Introduce the special tool on the mixture control screw [2] at the carburetor bottom. Press the tool slightly upward and turn the adjusting wheel [3] until the tool engages the slot of the mixture control screw.

Now, you can go about adjusting the screw. Marks were provided on the adjusting wheel, making it easier to keep track of the turns.

Checking the float level (float height) *

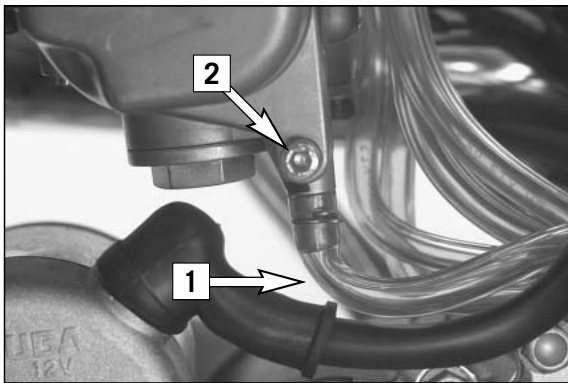
For this purpose, dismount the carburetor and remove the float chamber. Hold the carburetor in a slanted position such that the float will abut the float needle valve but not compress it.

In this position, the edge of the float should be parallel with the float chamber sealing surface (see illustration).

If the float height does not correspond to the desired value, check the float needle valve and, if necessary, replace it.

If the float needle valve is o.k., you can adjust the float height by bending the float lever [4].

Mount the float chamber, install the carburetor, and adjust the idle speed.



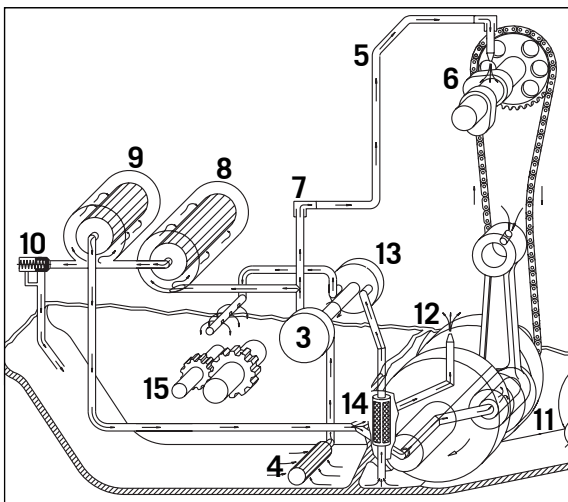
Draining the float chamber of the carburetor

Following every wet cleaning procedure, the float chamber of the carburetor should be drained in order to remove any water that may have penetrated into it. Water in the float chamber causes malfunctioning. Perform this task on a cold engine.

Close the fuel tap and put one end of the hose [1] into a collecting vessel. Open the drain plug [2] (turning it counterclockwise) by several turns, and drain the fuel from the float chamber. Then, retighten the drain plug and open the fuel tap.

⚠ WARNING

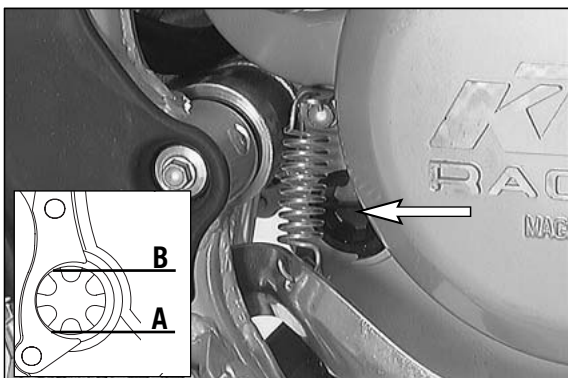
- FUEL IS EASILY FLAMMABLE AND TOXIC. WHEN HANDLING FUEL, BE SURE TO EXERCISE THE UTMOST CAUTION. NEVER PERFORM ANY WORK ON THE FUEL SYSTEM NEAR OPEN FLAMES OR BURNING CIGARETTES.
- ALWAYS ALLOW THE ENGINE TO COOL OFF FIRST. IMMEDIATELY CLEAN UP ANY FUEL WHICH MAY HAVE BEEN SPILLED. MATERIALS SATURATED WITH FUEL ARE ALSO EASILY FLAMMABLE. IN CASE YOU INGESTED FUEL OR FUEL SPLASHED INTO YOUR EYES, CONSULT A DOCTOR IMMEDIATELY.
- DISPOSE OF THE FUEL PROPERLY.



Oil circuit

Via the long oil screen [4], the oil pump [3] draws engine oil from the oil sump of the transmission. This engine oil flows through an oil line [5] into the cylinder head for camshaft lubrication [6]; the oil quantity is controlled by the jet screw [7]. An oil duct branches off to the long oil filter [8] where the coarser particles contained in the engine oil are filtered away. Then, the engine oil arrives at the short oil filter [9] which also filters the fine particles. Now, the purified engine oil is pumped past the bypass valve [10] to the conrod bearing [11] and sprayed from below onto the piston through a nozzle [12].

The second oil pump [13] draws the engine oil via the short oil screen [14] out of the crankcase, thereby lubricating the transmission gears [15].



Checking the engine oil level

The engine oil level can be checked with the engine either warm or cold. Place the motorcycle in an upright position and on a horizontal surface (not on the side stand).

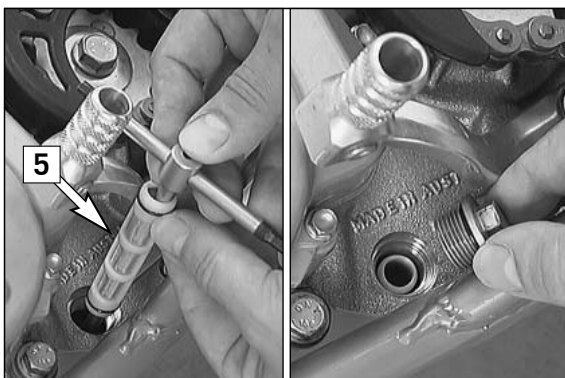
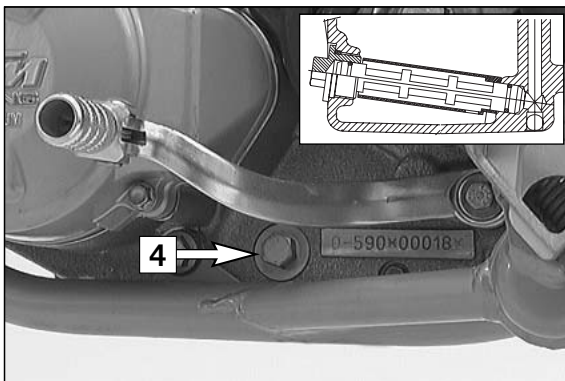
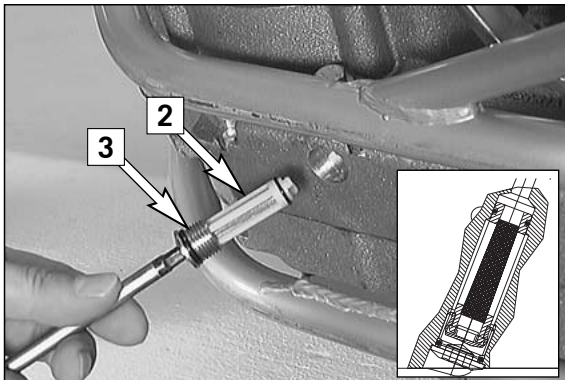
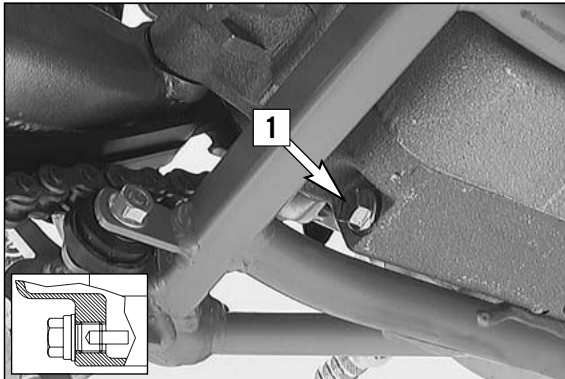
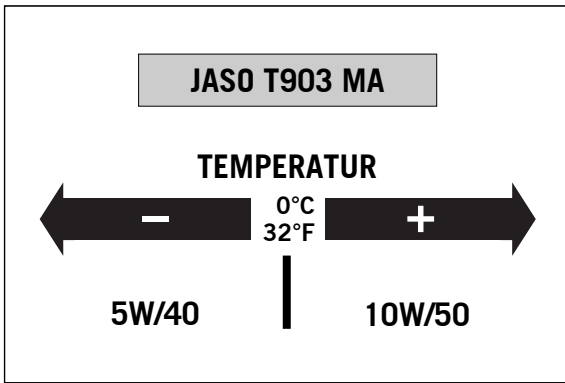
If the engine is cold, the engine oil must be visible at the lower edge of the inspection glass [A].

If the engine is warm, the engine oil must be visible up to the upper edge of the inspection glass [B].

Replenish the engine oil, if necessary.

! CAUTION

INSUFFICIENT AMOUNTS OF OR LOW-GRADE ENGINE OIL LEAD TO PREMATURE WEAR IN THE ENGINE.



Engine oil

Automobile engine oil used to be used for four-stroke motorcycles before there were separate motorcycle specifications. Different technical developments made it necessary to have a separate specification for four-stroke motorcycles - the JASO T903 MA standard. Whereas car engines require long changing intervals, motorcycle engines require a higher power output at higher speeds. Most motorcycle engines also use the same oil to lubricate the transmission and the clutch. The JASO MA standard responds to these special requirements. Only use fully synthetic engine oils that meet the JASO MA quality requirements (see information on the can).

KTM recommends Motorex Power Synt 4T in the 10W/50 viscosity (for temperatures over 0°C, 32°F) or 5W/40 (for temperatures under 0°C, 32°F).

! CAUTION

INSUFFICIENT OIL OR POOR QUALITY OIL RESULTS IN PREMATURE WEAR OF THE ENGINE.

Changing the engine oil *

Note: When changing the engine oil, it is necessary to clean the short and long oil screens and to replace both oil filters.

Engine oil has been changed with the engine at an operating temperature.

! CAUTION

AN ENGINE AT OPERATING TEMPERATURE AND THE ENGINE OIL IT CONTAINS ARE VERY HOT - DO NOT BURN OR SCALD YOURSELF.

Place the motorcycle on a horizontal surface, remove the plug [1] and allow the oil to drain into a receptacle.

Clean plug (with magnet) thoroughly.

Once the entire oil has been drained, clean the sealing surface, mount the plug together with the sealing ring and tighten it to 20 Nm.

CLEANING THE SHORT OIL SCREEN

The short oil screen [2] is accommodated in the hex-socket plug [3] at the engine bottom. Insert a pin-type key into the plug and tap on the key a few times with a hammer in order to relieve the stress acting on the plug. Dismount the oil screen, clean the components thoroughly and blow compressed air through them. Check the O-rings for damage and, if necessary, replace them. Mount the oil screen together with the plug again and tighten the plug to 10 Nm.

CLEANING THE LONG OIL SCREEN

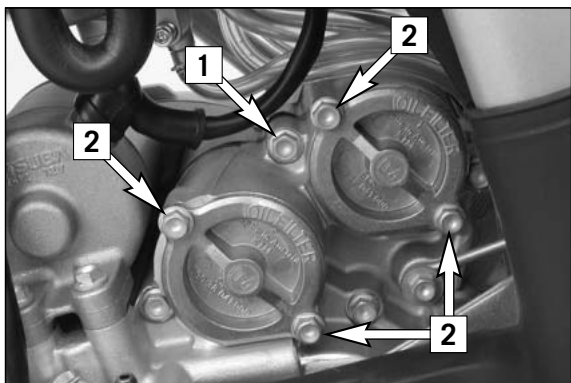
The long oil screen is accommodated in the hexagon plug [4] adjacent to the engine number. Dismount the plug together with the oil screen, clean the components thoroughly and blow compressed air through them. Check the O-rings for damage and, if necessary, replace them.

To mount the long oil screen [5], place it on an approx. 300 mm (12 in) long pin-type key or a similar tool. Insert the pin-type key through the opening into the bore of the opposite engine casing wall. Then, push the oil screen into the engine casing as far as possible. Remove the pin-type key, mount the plug and tighten it to 15 Nm.

! CAUTION

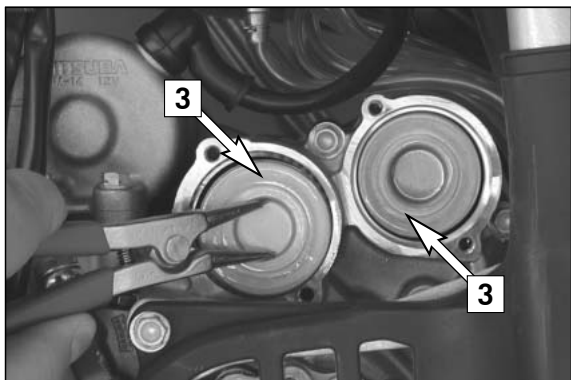
THE OIL SCREEN IS MOUNTED SLIGHTLY DOWNWARDS, INCORRECTLY FITTED, THE SCREEN LOSES ITS FUNCTION AND THIS CAN CAUSE INCREASED ENGINE WEAR.

MAINTENANCE WORK ON CHASSIS AND ENGINE »

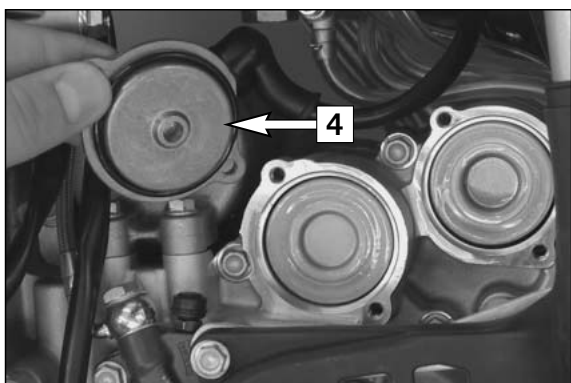


Changing the oil filters

Remove the screw **[1]** and swing the brake fluid container sideward. Place a receptacle underneath the engine to collect the drained oil. Remove the 4 screws **[2]** and dismount the two oil filter covers.



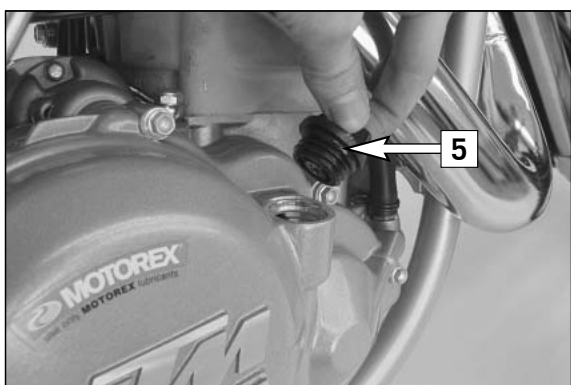
Using circlip pliers, pull the oil-filter inserts **[3]** out of the housing. Clean the oil filter cover, the sealing surfaces of the O-rings and the engine casing. Check the O-rings of the oil filter covers for damage and, if necessary, replace them.



Put the motorcycle on its side and fill the oil filter housings about halfway with engine oil. Fill oil filter with oil, place the long oil filter in the front and the short filter in the back of the filter box.

Grease the O-rings **[4]** of the oil filter covers and mount the covers. Mount the screws and tighten them to 6 Nm.

Position the brake fluid container and tighten the screw to 8 Nm.



Return the motorcycle to an upright position.

Remove the oil dipstick **[5]** at the clutch cover and fill in 1.2 liters of fully synthetic engine oil (Motorex Power Synt 4T 10W/50).

Start the engine and check all screwed connections and the oil filter cover for leaks.

Finally, check the engine oil level and, if necessary, correct it.

TROUBLESHOOTING »

If you had the specified maintenance work on your motorcycle carried out, disturbances can hardly be expected. Should an error occur nevertheless, we advise you to use the troubleshooting chart in order to find the cause of error. We would like to point out that many operations cannot be performed by yourself. In case of uncertainty, please contact a KTM-dealer.

TROUBLE	CAUSE	REMEDY
Engine doesn't crank (E-starter).	Operating error	Turn on the emergency-OFF switch (Australia only)
	Blown fuse	Dismount the left paneling and the filter box cover and replace the fuse in the starter relay.
	Discharged battery.	Recharge the battery and investigate the causes for discharging; contact a KTM dealer.
	Low outside temperature	Start the engine with the kickstarter
Engine cranks but doesn't start (E-starter).	Operating error	Open fuel tap, tank fuel, actuate choke. Pay attention to starting information (see driving instructions).
Engine will not start (Kickstarter).	The motorcycle has been out of operation for a longer period of time. Therefore old fuel has accumulated in the float chamber	The easily inflammable components of the new fuels evaporate during longer periods of standing still. When the motorcycle has been out of operation for more than a week, it is therefore recommended to drain the old fuel from the float chamber. The engine will immediately start when the float chamber is filled with new fuel.
	Fuel supply interrupted	Close fuel tap, loosen fuel hose at carburetor, lead into a basin and open fuel tap <ul style="list-style-type: none"> – if fuel leaks out, the carburetor may need cleaning – if no fuel leaks out, check tank ventilation, i.e. clean fuel tap
	Flooded engine	In order to "pump the engine free", pull the hand decompression lever, fully rev up the engine, actuate the kickstarter 5 to 10 times or actuate the E-starter 2 times for 5 seconds each. Then, start the engine as described above. If the engine fails to start, unscrew the spark plug and dry it.
	Sooty or wet spark plug	Clean and dry the spark plug or exchange it, respectively
	Electrode gap too large	Adjust spark plug electrode gap to 0.6 mm
	Spark plug connector or spark plug faulty	Dismount spark plug, connect ignition cable, hold to ground (blank place on engine) and actuate starter, a strong spark must be produced at the spark plug <ul style="list-style-type: none"> – If no spark is created replace the spark plug. – If the new spark plug doesn't produce a spark either, disconnect the spark plug connector from the ignition cable, hold it a distance of approx. 5 mm from ground and start. – If a spark now occurs, replace spark plug cap – If no spark is produced, control ignition system
	Short circuit cable scored in wiring harness, emergency OFF switch or short circuit button faulty	Dismount the fuel tank, disconnect the black/yellow cable from the cable of the emergency-OFF switch and the short-circuit button, respectively, and check the ignition spark. If a spark is generated, look for the problem in the short-circuit circuit.
	The plug connection of the CDI-unit, the pulse generator or the ignition coil has oxydized	Remove the seat and the fuel tank. Clean the plug connection and treat it with contact spray
	Water in carburetor or jets blocked	Dismount and clean the carburetor
Engine fails to idle	Glogged idling jet	Disassemble the carburetor and clean the jets
	Incorrect adjustment of adjusting screws on carburetor	Have the carburetor adjusted
	Defective spark plug	Replace the spark plug
	Defective ignition system	Have the ignition system checked

TROUBLE	CAUSE	REMEDY
Engine does not rev high	Carburetor fuel level too high because float needle valve is dirty or worn out	Dismount carburetor and check if worn out
	Loose carburetor jets	Tighten jets
	Electronic ignition timing faulty	Have ignition system checked
Engine will not reach full power	Fuel supply partially interrupted or carburetor dirty	Clean and check fuel system as well as carburetor
	Float leaks	Replace the float
	Air filter very dirty	Clean or replace air filter
	Exhaust system is not tight, deformed, or the silencer does not contain enough glass-fiber yarn	Check if exhaust is damaged, replace glasfiber yarn in exhaust silencer
	Valve gap too small	Adjust valve gap
	Loss of compression because hand decompressor has no play	Check setting of the hand decompression cable
	Electronic ignition timing faulty	Have ignition system checked
Engine stops or splutters in carburetor	Insufficient fuel	Clean and check fuel system and carburettor
	Engine takes air out of control	Check rubber sleeve and carburetor for tight fit
Engine gets too hot	Insufficient cooling liquid	Refill cooling liquid (see maintenace work), check cooling system for leaks
	Not enough air stream	Drive on briskly (electric fan can be retrofitted)
	Cooling system has not been bled	Bleed cooling system
	Radiators very dirty	Clean radiators with water jet
	Foam formation in cooling system	Replace cooling liquid, use antifreeze liquid with brand name
	Bent cooling hose	Shorten or replace cooling hose
	Thermostat defective	Dismount and check thermostat (opening temperature 70°C, (158°F) or replace it
High oil consumption	Hose of engine ventilation is bent	Dislocate i.e. replace non-buckling vetilation hose
	Engine oil level too high	Check engine oil level and, if necessary, correct it
	Motor oil too thin (viscosity)	Use thicker engine oil; see chapter “Engine oil“
All switched on lamps blown out	Capacitor or voltage regulator faulty	Dismount seat and fuel tank and check connections, have capacitor and voltage regulator checked
Horn, flasher lights and E-starter do not work	Blown fuse in the starter relay	Dismount left side paneling and filter box cover, replace fuse
The battery is discharged	The battery isn't charged by the generator because	Remove seat and fuel tank and check voltage regulator connections; voltage regulator and generator should be checked by a KTM dealer.

CLEANING »

Clean your motorcycle regularly in order to maintain the beauty of its plastic surfaces. The best manner would be to use warm water that has been mixed with a normal brand-name washing detergent and a sponge. The hard dirt can be removed before washing with the help of a soft water jet.

! CAUTION

NEVER CLEAN YOUR MOTORCYCLE WITH A HIGH-PRESSURED CLEANER OR A HIGH-PRESSURED WATER JET. THE WATER COULD OTHERWISE RUN INTO THE ELECTRICAL COMPONENTS, CONNECTORS, SHEATHED CABLES, BEARINGS, CARBURETOR, ETC. AND CAUSE DISTURBANCES OR LEAD TO A PREMATURE DESTRUCTION OF THESE PARTS.

- You should use normal brand-name detergents to clean the motorcycle. Especially dirty parts should also be cleaned with the help of a paint brush.
- Before cleaning with water, plug the exhaust pipe to prevent water ingress
- After the motorcycle has been rinsed with a soft water jet, it should be dried by air pressure and a cloth. Drain the float chamber of the carburetor. Then take a short drive until the engine has reached the working temperature and also use the brakes. By warming these components, the residual water can evaporate from inaccessible parts of the engine and the brakes.
- Slide back the protective covers on the handlebar-mounted instruments so that any water that may have seeped into this part of the motorcycle is allowed to evaporate.
- Once the motorcycle has cooled down, oil or grease all sliding and bearing points. Treat the chain with a chain spray. Also oil the fuel tap.
- To avoid any failures in of the electric system, you should treat the emergency-OFF switch, short-circuit button, light switch and socket connectors with a contact spray.

CONSERVATION FOR WINTER OPERATION »

In the event that the motorcycle is also used in winter and on roads where one has to expect salt spraying, you will have to take precautions against the aggressive road salt.

- clean the motorcycle thoroughly and let it dry after each ride
- treat the engine, carburetor, swing arm, and all other bare or galvanized parts (except for brake discs) with a wax-based anti-corrosion agent.

⚠ WARNING

KEEP THE ANTI-CORROSION AGENT FROM GETTING INTO CONTACT WITH THE BRAKE DISCS, OTHERWISE THIS WILL SIGNIFICANTLY REDUCE THE BRAKING POWER.

! CAUTION

AFTER RIDES ON SALTED ROADS, CLEAN MOTORCYCLE THOROUGHLY WITH COLD WATER AND LET IT DRY WELL.

STORAGE »

Should you wish to make a pause over a longer space of time, please observe the following instructions:

- Clean motorcycle thoroughly (see chapter: CLEANING)
- Change engine oil, short and long oil filters (old engine oil contains aggressive contaminants).
- Check antifreeze and amount of cooling liquid.
- Warm up the engine once again, close the fuel cock and wait until the engine dies. Then open the drain plug of the float chamber to remove the remaining fuel.
- Remove spark plug and fill in approx. 5 ccm of engine oil into the cylinder through the opening. Actuate kick-starter 10 times in order to distribute the oil onto the cylinder walls and mount the spark plug.
- Set piston to compression so that the valves will be closed (slowly operate the kickstarter until you can hear the automatic decompressor click (release))
- Let fuel flow out of tank into an appropriate container.
- Correct tire pressure.
- Lubricate pivot points of the control levers, foot rests, etc. as well as the chain.
- Service the shock absorber linkage
- Disassemble and charge battery (see chapter: BATTERY).
- The storage place should be dry and not subjected to excessive temperature fluctuations.
- Cover the motorcycle with an air permeated tarpaulin or blanket. Do not use airtight materials as a possible humidity might not be able to escape and could cause corrosion.

! CAUTION

IT WOULD BE VERY BAD TO LET THE ENGINE RUN FOR A SHORT TIME DURING THE STORAGE PERIOD. THE ENGINE WOULD NOT GET WARMED UP ENOUGH AND THE THUS DEVELOPED STEAM WOULD CONDENSE DURING THE COMBUSTION PROCESS AND CAUSE THE VALVES AND EXHAUST TO RUST.

USE AFTER A PERIOD OF STORAGE

- Mount the charged battery (regard polarity).
- Fill up tank with fresh fuel.
- Check motorcycle as before each start (see driving instructions).
- Take a short, careful test ride first.

NOTE: Before you put your motorcycle away for the winter, you should check all parts for their function and wear. Should any service jobs, repairs, or any refitting be necessary, you should have them carried out during the off-season (lower workload at mechanics' shops). This way, you can avoid the long waiting times at your mechanic at the beginning of the next biking season.

TECHNICAL DATA - ENGINE »

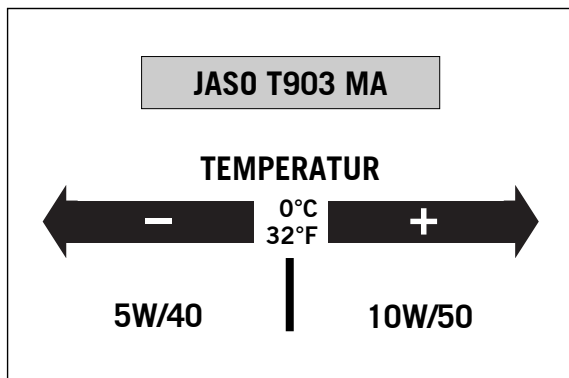
TYPE	250 EXC	400 EXC	450 SX	450 MXC	450 EXC	525 SX	525 MXC-G	525 EXC 525 MXC DESERT
Design	Liquid-cooled single cylinder 4-stroke engine with balancer shaft							
Displacement	250 cm³	398 cm³	449 cm³	448 cm³		510 cm³		
Bore/Stroke	75/56,5 mm	89 / 64 mm	95/63,4 mm	89 / 72 mm		95 / 72 mm		
Ratio	12 : 1			11 : 1				
Fuel	unleaded fuel with at least RON 95 (USA = Premium RON 91)							
Valve timing	4 valves over rocker arm and 1 overhead camshaft, camshaft drive through single chain							
Camshaft	5532	595/0121	590/5521	590/5521		55/21	590/5521	
Valve diameter Intake	28 mm	35 mm	35 mm (Titan)	35 mm				
Valve diameter Exhaust	24 mm	30 mm	30 mm (Titan)	30 mm				
Valve clearence cold Intake	0.12 mm (0.0047 in)							
Valve clearence cold Exhaust	0.12 mm (0.0047 in)							
Crank shaft bearing	2 cylinder roller bearing							
Connecting rod bearing	needle bearing							
Top end bearing	bronze bushing							
Piston alluminium alloy -	cast		forged	cast		forged		
Piston rings	1 compression ring, 1 oil scraper ring							
Engine lubrication	pressure circulation lubrication with two rotor pumps							
Engine oil	full synthetic oil (Motorex Power Synt 4T 10W/50)							
Quantity of engine oil	1.25 liters							
Primary ratio	straight geared spur wheels 33:76 Z							
Clutch	multi disc clutch in oil bath							
Transmission claw shifted	6-speed	6-speed	4-speed	6-speed	6-speed	4-speed	6-speed	6-speed
Gear ratio 1st Gear	14:38	14:34	16:32	16:32	14:34	16:32	16:32	14:34
2nd Gear	16:36	17:31	18:30	18:30	17:31	18:30	18:30	17:31
3rd Gear	19:34	19:28	20:28	20:28	19:28	20:28	20:28	19:28
4th Gear	21:32	22:26	22:26	22:26	22:26	22:26	22:26	22:26
5th Gear	23:30	24:23	-	24:24	24:23	-	24:24	24:23
6th Gear	22:25	26:21	-	21:18	26:21	-	21:18	26:21
Ignition system	contactless DC-CDI ignition with digital advanced system by KOKUSAN							
Generator	12V 150W		-	12V 150W		-	12V 150W	
Spark plug	NGK DCPR 8 E							
Spark plug gap	0.6 mm (0.02367 in)							
Cooling system	liquid cooled, permanent rotation of cooling liquid through mechanically driven water pump							
Cooling liquid	1 liter, 40% antifreeze, 60% water, at least -25° (-13° F)							
Starting equipment	kick - electric starter		kickstarter	kick - electric starter		kickstarter	kick - electric starter	

BASIC CARBURATOR SETTING				
	250 EXC RACING EU / AUS 11 kW	400 EXC RACING EU / AUS 12 kW	400 EXC-G RACING USA	450 EXC RACING EU / AUS 12 kW
Type	Keihin FCR-MX 3700A	Keihin FCR-MX 3900C	Keihin FCR-MX 3900C	Keihin FCR-MX 3900A
Main jet	160	178	178	178
Jet needle	OBEKT	OBDVR	OBDVR	OBDVR
Idling jet	42	42	42	42
Main air jet	200	200	200	200
Idling air jet	100	100	100	100
Needle position	3 rd from top	1 st from top	1 st from top	3 rd from top
Starting jet	85	85	85	85
Mixture control screw open	0,75	1,25	1,25	1,25
Slide	15	15	15	15
Performance restrictor	Slide stop	Slide stop	–	Slide stop
Stop pump membrane	858 / 2,15 mm	858 / 2,15 mm	858 / 2,15 mm	858 / 2,15 mm
Hot start device	–	–	–	–

BASIC CARBURATOR SETTING				
	450 EXC-G / MXC-G RACING USA	450 EXC RACING SIXDAYS	450 SX RACING	525 EXC / MXC RACING / DESERT RACING EU / AUS 12 kW
Type	Keihin FCR-MX 3900A	Keihin FCR-MX 3900A	Keihin FCR-MX 4122A	Keihin FCR-MX 3900B
Main jet	178	178	185	178
Jet needle	OBDVR	OBDTR	OBDTP	OBDVT
Idling jet	42	42	40	42
Main air jet	200	200	200	200
Idling air jet	100	100	100	100
Needle position	3 rd from top	4 th from top	4 th from top	3 rd from top
Starting jet	85	85	85	85
Mixture control screw open	1,25	2,0	1,0	1,25
Slide	15	15	15	15
Performance restrictor	–	–	–	Slide stop
Stop pump membrane	858 / 2,15 mm	858 / 2,15 mm	858 / 2,15 mm	858 / 2,15 mm
Hot start device	–	–	2,2 mm	–

BASIC CARBURATOR SETTING			
	525 MXC-G / EXC-G RACING USA	525 EXC RACING SIXDAYS	525 SX RACING
Type	Keihin FCR-MX 3900B	Keihin FCR-MX 3900B	Keihin FCR-MX 4125A
Main jet	178	178	185
Jet needle	OBDVT	OBDTR	OBDTP
Idling jet	42	42	42
Main air jet	200	200	200
Idling air jet	100	100	100
Needle position	3 rd from top	5 th from top	4 th from top
Starting jet	85	85	85
Mixture control screw open	1,25	2,0	1,5
Slide	15	15	15
Performance restrictor	–	–	–
Stop pump membrane	858 / 2,15 mm	858 / 2,15 mm	858 / 2,15 mm
Hot start device	–	–	2,5 mm

TIGHTENING TORQUES		
Hexagon collar screw, engine case, clutch cover, ignition cover	M6	10 Nm
Oil drain plug	M12x1,5	20 Nm
Allan head plug oil, screen short	M16x1,5	10 Nm
Hexagon plug, oil screen long	M20x1,5	15 Nm
Collar screw for oil filter cover	M5	6 Nm
Plug pressure valve	M12x1,5	20 Nm
Jet screw and hollow screw, oil line	M8	10 Nm
Screws, oil pump cover	M5	Loctite 222 + 6 Nm
Hexagon collar screw, cylinder head top section	M6	10 Nm
Hex.collar screw, cylinder head top section, water pump cover	M6	8 Nm
Hexagon collar screw, exhaust flange	M6	Loctite 243 + 8 Nm
Cylinder head screw	M10	40/50 Nm
Allan head screw, camshaft gear	M8	Loctite 243 + 28 Nm
Stop screw, autodecompression	M5	Loctite 222 + 8 Nm
Allan head screw, cap rocker arm	M5	5 Nm
Counter nuts, valve adjustment screw	M6x0,75	11 Nm
Allan head screw, primary gear, free wheel	M6	Loctite 648 + 16 Nm
Hexagon nut, primary gear	M20x1,5	Loctite 243 + 150 Nm
Allan head screw, balancer shaft gear	M6	Loctite 243 + 8 Nm
Nut for inner clutch hub	M18x1,5	Loctite 243 + 150 Nm
Hexagon collar screw, clutch spring	M6	8 Nm
Allan head screw, shift roller locking piece	M6	Loctite 243 + 10 Nm
Hexagon collar screw, locking lever	M5	Loctite 243 + 6 Nm
Hexagon collar screw, shift roller	M5	Loctite 243 + 6 Nm
Hexagon collar screw securing guide, chain guide, chain tensioner	M6	Loctite 243 + 8 Nm
Hexagon collar screw, clip	M5	Loctite 243 + 6 Nm
Hexagon collar screw, chain adjuster	M6	8 Nm
Hexagon collar screw, stator MXC/EXC	M6	Loctite 243 + 8 Nm
Hexagon collar screw, stator SX	M5	Loctite 243 + 6 Nm
Hexagon collar screw, pulser coil	M5	Loctite 243 + 6 Nm
Hexagon collar nut, flywheel	M12x1	60 Nm
Hexagon collar screw, bump part kickstarter	M6	Loctite 243 + 8 Nm
Hexagon collar screw, spring hanger kickstarter	M6	Loctite 243 + 10 Nm
Hexagon collar screw, cover E-starter, only SX	M6	Loctite 243 + 8 Nm
Hexagon collar screw, hanger vent hose	M6	Loctite 243 + 8 Nm
Allan head screw, kickstarter	M8	Loctite 243 + 25 Nm
Hexagon collar screw, shift lever	M6	Loctite 243 + 10 Nm
Hexagon screw, engine sprocket	M10	Loctite 243 + 60 Nm
Spark plug	M10	10-12 Nm
Spark plug	M12x1,25	20 Nm



Engine oil

Only use fully synthetic engine oils that meet the JASO MA quality requirements (see information on the can).

KTM recommends Motorex Power Synt 4T in the 10W/50 viscosity (for temperatures over 0°C, 32°F) or 5W/40 (for temperatures under 0°C, 32°F).

! CAUTION

POOR OIL QUALITY OR MINOR QUANTITY CAUSE EARLY ENGINE-WEAR.

TECHNICAL DATA - CHASSIS »

CHASSIS	450/525 SX	250/400/450/525 EXC/MXC DESERT	450/525 MXC-G, EXC-G USA
Frame	Central tube chrome-moly-steel frame		
Fork	4860 PA/MA	WP Up Side Down 4860 MA	
Wheel travel front/rear	300/335 mm		
Rear suspension	WP Progressive Damping System shock absorber, aluminium swing arm		
Front brake	Disk brake with carbon-steel brake disc Ø 260 mm (10.2 in), brake caliper floated		
Rear brake	Disk brake with carbon-steel brake disc Ø 220 mm (8.7 in), brake caliper floated		
Brake disc	Wear limit max. 2,5 mm front and 3,5 mm rear		
Front tires	80/100 - 21"	90/90 - 21"	80/100 - 21"
Air pressure offroad	1.0 bar (14 psi)	1.0 bar (14 psi)	1.0 bar (14 psi)
Air pressure road driver only	–	1,5 bar	1.5 bar (21 psi)
Rear tires	110/90 - 19"	140/80 - 18"	110/100 - 18"
Air pressure offroad	1.0 bar (14 psi)	1.0 bar (14 psi)	1.0 bar (14 psi)
Air pressure road driver only	–	2.0 bar (28 psi)	2.0 bar (28 psi)
Fuel tank capacity	7 liters (2 US gallons)	EXC 8,5 liters (2.1 US gallons) MXC 13 Liter (3.5 gallons)	
Final drive ratio	450-14:52Z / 525-14:48Z	250-15:45Z / 450-15:45Z / 525-15:45Z	450-14:50Z / 525-14:48Z
Chain	X-Ring 5/8 x 1/4 "		
Available final sprockets	38Z, 40Z, 42Z, 45Z, 48Z, 50Z, 52Z		
Bulbs	headlight	12V 35/35W (Socket BA20D)	
	parking light	12V 5W (Socket W2, 1x9,5d)	
	brake - rear light	12V 21/5W (Socket BaY15d)	
	flasher light	12V 10W (Socket Ba15s)	
	license plate illumination	12V 1,2W (Socket 1x4,6d)	
Battery	maintenance-free battery 12V 8Ah		
Steering head angle	63,5°		
Wheel base	1481 ± 10 mm (58.3 ± 0.4 in)		
Seat height, unloaded	925 mm (36.5 in)		
Ground clearance, unloaded	380 mm (15.1 in)		

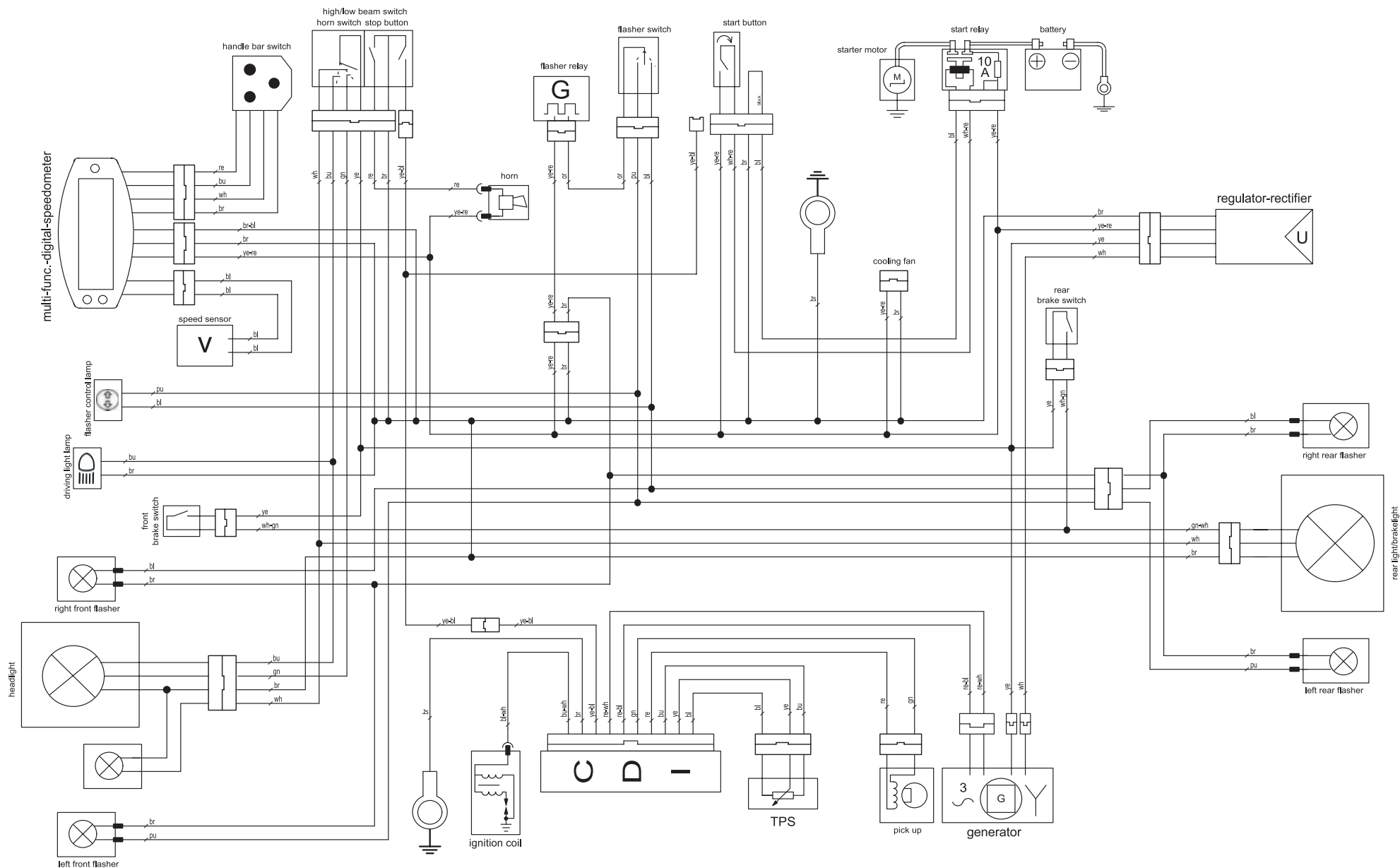
STANDARD ADJUSTMENT - FORK		
	SX	MXC, MXC Desert, EXC, EXC-G
	WP4860PA/MA 14187A05	WP4860MA 14187A06
Compression adjuster	22	20
Rebound adjuster	20	20
Spring	4,6 N/mm	4,2 N/mm
Spring preload	5 mm	5 mm
Air chamber length	100 mm	110 mm
Fork oil	SAE 5	SAE 5

STANADARD ADJUSTMENT-SHOCK ABSORBER		
	SX	MXC, MXC Desert, EXC, EXC-G
	WP 5018 PDS DCC 12187A05	WP 5018 PDS MCC 12187A06
Compression adjuster	15 LS (low speed) 2 HS (high speed)	15
Rebound adjuster	22	22
Spring	88/250	88/250
Spring preload	7 mm	7 mm

TECHNICAL DATA - CHASSIS »

TIGHTENING TORQUES - CHASSIS		
Collar screw, front wheel spindle	M24x1,5	40 Nm
Brake caliper, front	M8	Loctite 243 + 25 Nm
Brake caliper, FTE radial front	M10x1,25	Loctite 243 + 40 Nm
Brake disk	M6	Loctite 243 + 10 Nm
Clamping screws, upper fork bridge EXC	M8	20 Nm
Clamping screws, lower fork bridge EXC	M8	15 Nm
Clamping screws, upper fork bridge SX	M8	15 Nm
Clamping screws, lower fork bridge SX	M8	10 Nm
Clamping screws, fork stubs	M8	10 Nm
Hexagon nut, swing arm bolt	M16x1,5	100 Nm
Hexagon collar screw, handlebar clamp	M8	20 Nm
Allan head screw, handlebar support	M10	Loctite 243 + 40 Nm
Shock absorber, top	M12	80 Nm
Shock absorber, bottom	M12	80 Nm
Collar nut, swing arm bolt	M20x1,5	80 Nm
Sprocket Screws	M8	Loctite 243 + 35 Nm
Ball joint for push rod	M6	Loctite 243 + 10 Nm
Engine mounting bolt	M10	60 Nm
Engine brace	M8	33 Nm
Spoke nipple	M4,5 / M5	5 Nm
Screw adjusting ring spring preload shock abs.	M6	8Nm
Other screws on chassis	M6	10 Nm
	M8	25 Nm
	M10	45 Nm
Other collar nuts on chassis	M6	15 Nm
	M8	30 Nm
	M10	50 Nm

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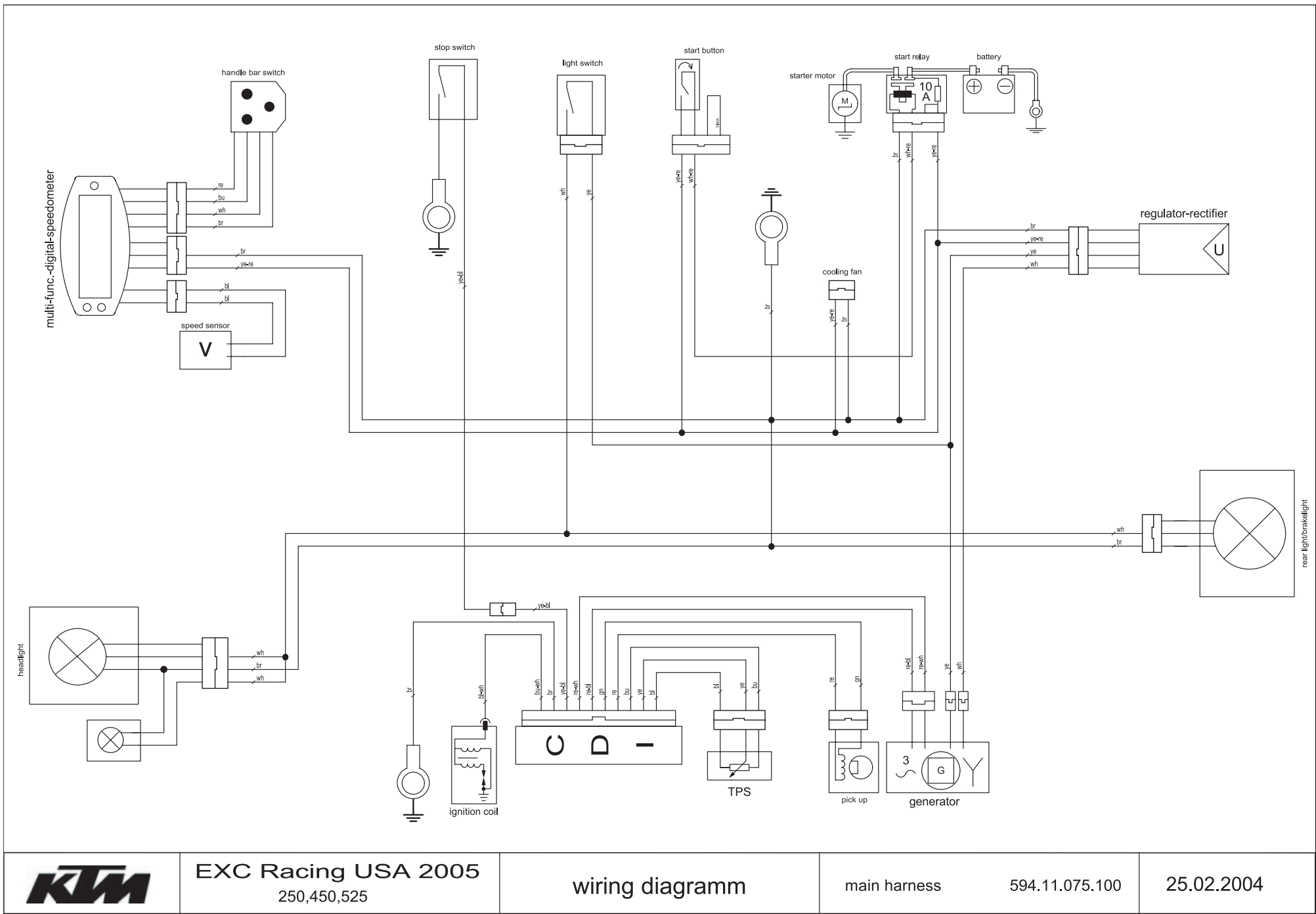
EXC Racing 2005
250,450,525

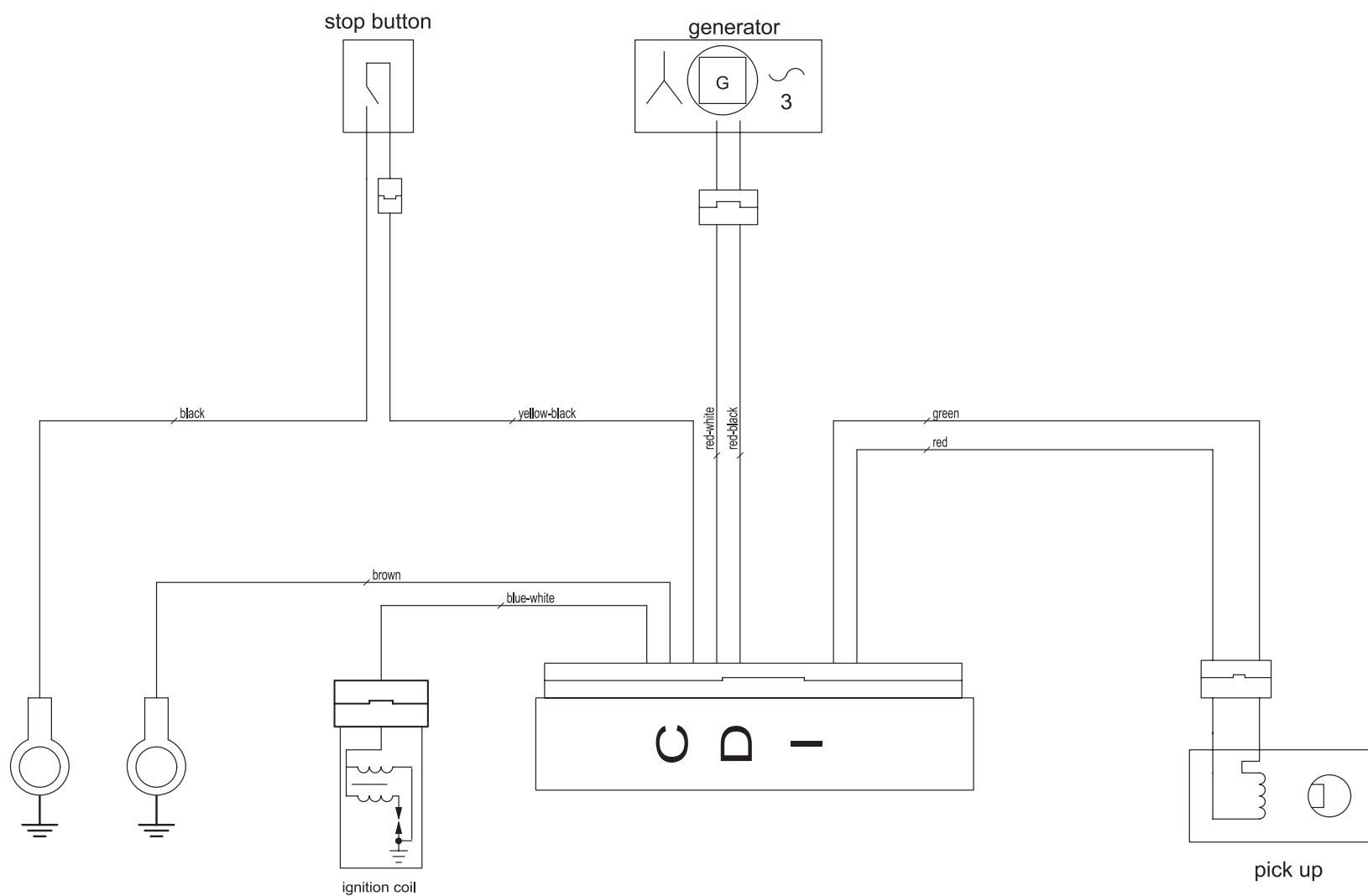
wiring diagramm

main harness

594.11.075.050

05.03.2004





SX 450-525 2005

CDI harness - 594.39.032.000

20.02.2004

SCHALTPLAN » WIRING DIAGRAMM

ENGLISH	DEUTSCH	ITALIANO
Battery	Batterie	Batteria
Cooling fan	Lüftermotor	Motorino ventola
Driving light lamp	Fernlichtkontrolle	spia abbagliante
Flasher control lamp	Blinkerkontrolle	spia lampeggiatori
Flasher relay	Blinkerrelais	Relè indicatori
Front brake switch	vorderer Bremslichtschalter	Interruttore luce ant. di stop
Generator	Generator	Generatore
Handle bar switch for multi-func.-digital-speedometer	Lenkerschalter für Kombiinstrument	Interruttore sul manubrio per tachimetro multifunzione
Headlight	Scheinwerfer	Faro anteriore
High / low beam switch	Auf-Abblendschalter	Commutatore abbagliante/anabbagliante
Horn	Hupe	Avvisatore acustico
Ignition coil	Zündspule	Bobina d'accensione
Ignition switch	Zündschloss	Interruttore d'accensione
Left front flasher	linker vorderer Blinker	Indicatore ant. sx
Left rear flasher	linker hinterer Blinker	Indicatore post. sx
Multi-func.-digital-speedometer	Multifunktionsdigitaltacho	Tachimetro digitale multifunzione
Pick up	Impulsgeber	Pick up
Position light	Standlicht	Luce di posizione
Rear brake switch	hinterer Bremslichtschalter	Interruttore luce post. di stop
Rear light / brakelight	hinteres Begrenzungslicht / Bremslicht	Luce post. di posizione/stop
Regulator-rectifier	Regelgleichrichter	Regolatore-raddrizzatore
Right front flasher	rechter vorderer Blinker	Indicatore ant. dx
Right rear flasher	Rechter hinterer Blinker	Indicatore post. dx
Speed sensor	Geschwindigkeitssensor	Sensore velocità
Start button	Starttaster	Pulsante d'avviamento
Start relay	Startrelais	Relè d'avviamento
Starter motor	Startermotor	Motorino d'avviamento
Stop button	Not-Aus-Schalter	Interruttore di arresto d'emergenza
Throttle position sensor (TPS)	Vergaserpotentiometer	Potenzimetro carburatore (sensore TPS)

CABLE COLOURS	KABELFARBEN	CAVO COLORATO
bl: black	bl: blau	bl: nero
ye: yellow	ye: gelb	ye: giallo
bu: blue	bu: blau	bu: blu
gn: green	gn: grün	gn: verde
re: red	re: rot	re: rosso
wh: white	wh: weiß	wh: bianco
br: brown	br: braun	br: marrone
or: orange	or: orange	or: arancione
pi: pink	pi: rosa	pi: rosa
gr: grey	gr: grau	gr: grigio
pu: purple	pu: violett	pu: violetto

SCHALTPLAN » WIRING DIAGRAMM

ENGLISH	FRANCAIS	ESPANOL
Battery	Batterie	Batería
Cooling fan	Ventilateur	Motor del ventilador
Driving light lamp	temoin feu route	lampara aviso luces largas
Flasher relay	Relais de clignotants	Relé de la luz intermitente
Flasher control lamp	temoin de clignoteur	lampara aviso intermitentes
Front brake switch	Contacteur de frein avant	Interruptor de luz del freno delantero
Generator	Alternateur	Generador
Handle bar switch for multi-func.-digital-speedometer	Contacteur au guidon pour ordinateur de bord	Interruptor de manillar para instrumento combinado
Headlight	Phare	Faro
High / low beam switch	Contacteur code/phare	Interruptor de encender/apagar la luz larga
Horn	Avertisseur sonore	Cláxon
Ignition coil	Bobine d'allumage	Bobina de encendido
Ignition switch	Contacteur d'allumage	Cerradura de encendido
Left front flasher	Clignotant avant gauche	Luz intermitente izquierda delantera
Left rear flasher	Clignotant arrière gauche	Luz intermitente izquierda trasera
Multi-func.-digital-speedometer	Ordinateur de bord	Velocímetro digital multifuncional
Pick up	Capteur d'allumage	Generador de impulsos
Position light	feu de position	luz de posicion
Rear brake switch	Contacteur de frein arrière	Interruptor de luz del freno trasero
Rear light / brakelight	Feu rouge/stop	Luces de parqueo traseras /luces de freno
Regulator-rectifier	Régulateur/redresseur	Regulador rectificador
Right front flasher	Clignotant avant droit	Luz intermitente derecha delantera
Right rear flasher	Clignotant arrière droit	Luz intermitente derecha trasera
Speed sensor	Capteur de vitesse	Sensor de velocidad
Start button	bouton de démarrage	botón de arranque
Start relay	Relais de démarreur	Relé del arranque
Starter motor	Démarreur	Motor de arranque eléctrico
Stop button	bouton d'arrêt d'urgence	interruptor de parada de emergencia
Throttle position sensor (TPS)	Capteur d'ouverture de carburateur	Potenciómetro del carburador

CABLE COLOURS	COULEUR DE CABLE	COLOR DE CABLE
bl: black	bl: noir	bl: negro
ye: yellow	ye: jaune	ye: amarillo
bu: blue	bu: bleu	bu: azul
gn : green	gn: vert	gn: verde
re: red	re: rouge	re: rojo
wh: white	wh: blanc	wh: blanco
br: brown	br: brun	br: marron
or: orange	or: orange	or: naranja
pi: pink	pi: rose	pi: rosado
gr: grey	gr: gris	gr: gris
pu: purple	pu: violet	pu: violeta

REPAIRMANUAL2000-2005

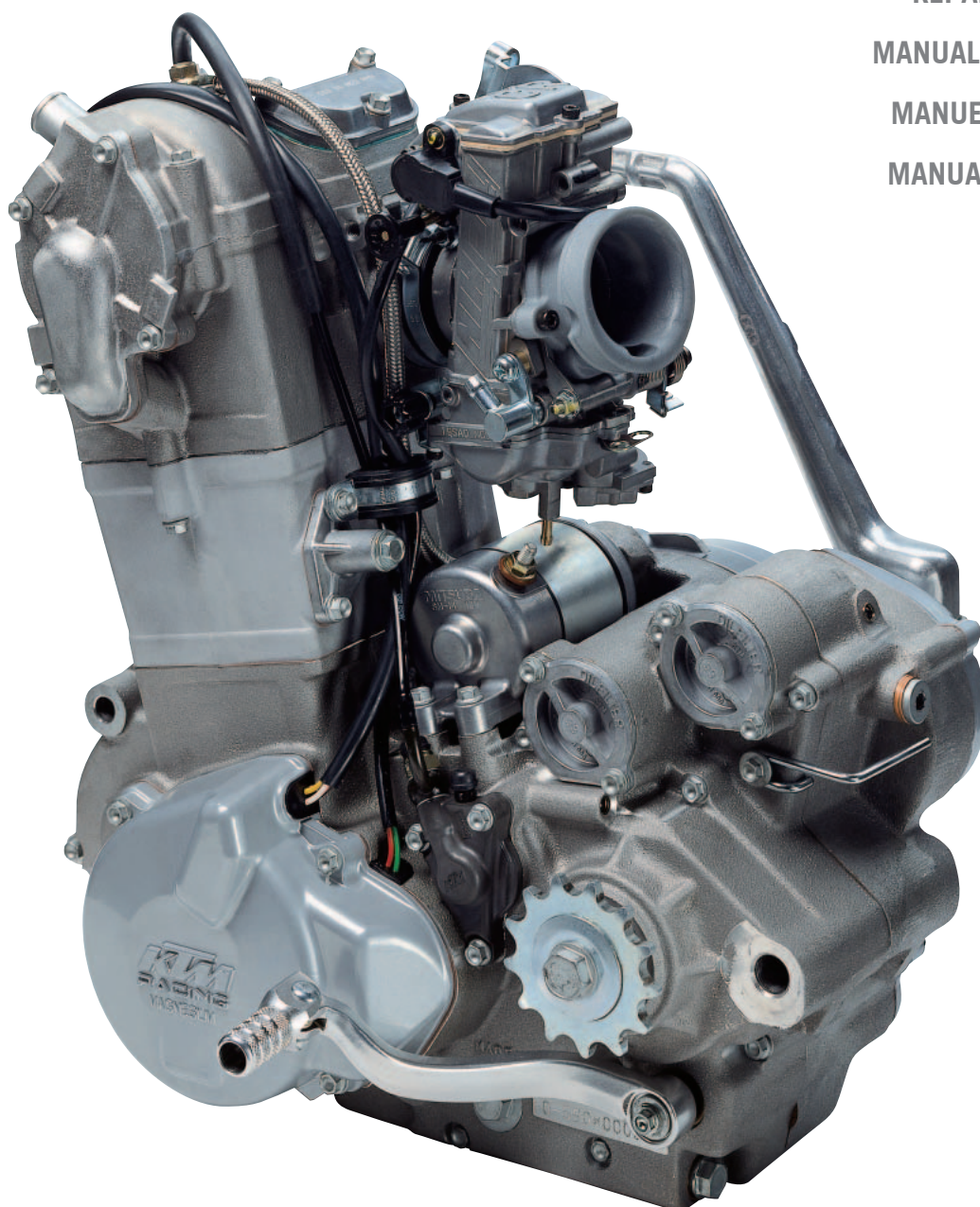
250 EXC RACING
400/450 SX,MXC,EXC,SMR,SXS RACING
520/525 SX,MXC,EXC,SMR RACING
540 SXS RACING, 610 CRATE

REPARATURANLEITUNG

MANUALE DI RIPARAZIONE

MANUEL DE RÉPARATION

MANUAL DE REPARACIÓN



Art. NR.: 3.206.023-E

KTM

1 SERVICE-INFORMATIONS

2 GENERAL INFORMATION

3 REMOVING AND REFITTING ENGINE

4 DISASSEMBLING ENGINE

5 SERVICING INDIVIDUAL COMPONENTS

6 ASSEMBLING ENGINE

7 ELECTRICAL

8 FUEL SYSTEM

9 TROUBLE SHOOTING

10 TECHNICAL SPECIFICATIONS

11 PERIODIC MAINTENANCE SCHEDULE

12 WIRING DIAGRAMS

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EXPLANATION - UPDATING

3.205.85-E	Repair Manual 400/520 SX, MXC, EXC RACING Basic version Model year 2000 (Engine number with first digit "0")	2/2000
3.210.01-E	Updating of Rep.Manual 3.205.85-E Model year 2001 (Engine number with first digit "1")	1/2001
3.210.44-E	Updating of Rep.Manual 3.205.85-E Model year 2002 (Engine number with first digit "2")	2/2002
3.206.007-E	Updating of Rep.Manual 3.205.85-E Model year 2003 (Engine number with first digit "3")	1/2003
3.206.013-E	Updating of Rep.Manual 3.205.85-E Model year 2004 (Engine number with first digit "4")	9/2003
3.206.023-E	Updating of Rep.Manual 3.205.85-E Model year 2005 (Engine number with first digit "5")	7/2004

Modification / Updating:

Technical Details, Technical Specifications,
Periodic Maintenance Schedule, Trouble Shooting, Wiring Diagrams

INTRODUCTION

This repair manual offers extensive repair-instructions and is an up-to-date version that describes the latest models of the series. However, the right to modifications in the interest of technical improvement is reserved without updating the current issue of this manual.

A description of general working modes common in work shops has not been included. Safety rules common in the work shop have also not been listed. We take it for granted that the repairs are made by qualified professionally trained mechanics.

Read through the repair manual before beginning with the repair work.

⚠	WARNING	⚠
STRICT COMPLIANCE WITH THESE INSTRUCTIONS IS ESSENTIAL TO AVOID DANGER TO LIFE AND LIMB.		

!	CAUTION	!
NON-COMPLIANCE WITH THESE INSTRUCTIONS CAN LEAD TO DAMAGE OF MOTORCYCLE COMPONENTS OR RENDER MOTORCYCLES UNFIT FOR TRAFFIC !		

„NOTE” POINTS OUT USEFUL TIPS.

Use only **ORIGINAL KTM SPARE PARTS** when replacing parts.

The KTM high performance engine is only able to meet user expectations if the maintenance work is performed regularly and professionally.



REG.NO. 12 100 6061

In accordance with the international quality management ISO 9001 standard, KTM uses quality assurance processes that lead to the highest possible product quality.

KTM Sportmotorcycle AG
5230 Mattighofen, Austria

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Dpt.:

No.: 0403/07/01-E

FH

11.03.2004

Customer Service

Subject:	Gasket for filler cap
Model:	2stroke / 4stroke Racing / 625 SXC / 660 SMC
Countries:	all

Dear KTM Distributor!

Due to a defect on the injection tool for filler cap **590 07 009 000** at our supplier, it may happen, that the bleeding holes keep closed. This could prevent proper bleeding and subsequently cause malfunction in fuel supply to the carburettor.

For instance, if a customer claims insufficient throttle response on his motorcycle, please first check the correct bleeding holes on the gasket for filler cap, before conducting extensive failure detection.

As the possible affected motorcycles can not be limited , we recommend to check and if necessary to correct the gaskets for filler cap on motorcycles during pre-delivery inspection, before handover to the customers.

When we became aware of the problem, production- and spareparts stock have been checked immediately and corrected.

T. Stöcklmeier
Sales

S. Pierer
CEO

W. Pichlmair
Quality Management

F. Haslinger
After Sales Service

E. Sellmaier
R & D

Dpt.: Customer Service No.: 0402/30/06-E

FH

02.02.2003

Subject:	drive gear (on crankshaft) for balancer shaft
Model:	450 EXC Racing 2004 as per Excel file
Countries:	AU, ES, IT, UK, US

Dear KTM Distributer!

On all **450 EXC bikes listed in the attached Excel sheet** cracks on the drive gear for the balancer shaft can occur due to hardening failures.

For this reason we kindly ask you to instruct your dealers to replace the affected gear **590 30 055 000** immediately.

Parts are available in sufficient numbers as only a small number of bikes is affected.

To conduct the repair **drive gear 590 30 055 000** and **gasket set 590 30 099 000** are required.

Please make a warranty claim when repair is finished and use the code for **crank replacement T3900230090** to claim for labour.

After repair please scrap the replaced gear!

T. Stöcklmeier
Vertrieb

S. Pierer
Vorstand

W. Pichlmair
Qualitätssicherung

F. Haslinger
Kundendienst

E. Sellmaier
Technik

Dept.:

Nr.: 0310/30/03-E

FH

14.10.2003

Customer Service

Subject: Compression reduction to compensate for fuel quality fluctuations

Model: 450 EXC, 450 MXC Models 2003 / 2004

Countries: All

Dear KTM Distributor!

Due to regional fluctuations in the quality of fuel it is possible that the engines in the above mentioned models may knock and consequently sustain damages resulting from that.

Because of this we request you to advise your customers to use fuel which has a Research-Octane (ROZ) rating **above** 95.

In course of engine repairs we are requesting you to use a new, thicker cylinder base gasket with **part no. 594 30 035 000** (0.8 mm).

This new gasket may be ordered individually and is available immediately in the KTM Spare Parts Center. It is also included in the gasket set in a separate package marked for models **450 EXC and 450 MXC**.

T.Stöcklmeier
Sales

W. Pichlmair
Quality Management

F. Haslinger
Customer Service

E. Sellmaier
R&D

Dept.:

Nr.: 0310/36/03-E

FH

14.10.2003

Customer Service

Subject: Cylinder head / HH –Collarscrew 0015 060553

Model: 4-Stroke Racing Models 2004

Countries: All

Dear KTM Distributor!

Due to quality variances on the HH Collarscrew M6 X 55 (No. 0015 060553) we request that you replace these screws during the course of other work, performed on 2004 4-stroke Racing models, with two AH Screws **M6 X 55 Qual. 12.9, (No. 0912 060551)** including two new copper seal washers DIN 7603-6X10X1 (**No. 0603061001**).

The new AH screws are being installed in series production since September 1st, 2003, beginning with engine number **04-594*69364**, that is VIN **VBKRCA4024M371530**.

Vehicles that were manufactured before September 1st and delivered to you are listed in the attached Excel file.

Please order the required quantities from the KTM Spare Parts Center.

For this retrofit KTM will compensate the parts and through the use of **Code T39002 36 970** 10 minutes of labour per motorcycle.

T.Stöcklmeier
Sales

W. Pichlmair
Quality Management

F. Haslinger
Customer Service

E. Sellmaier
R&D

Dept.: KD

Nr.: 0002/35/02-D

PL

10.02.2000

Regarding: Overheating at high outside temperatures**Model:** Racing 400/520 SX/EXC**Countries:** all

For operation at high outside temperatures we have designed a conversion kit to prevent from possible overheating problems. This kit is available at spare parts department.

The additional tank „left '99“, which is connected to the left radiator via a hose, is used as a expansion reservoir and should be filled half with coolant.

Take care to mount the hose without any kink.

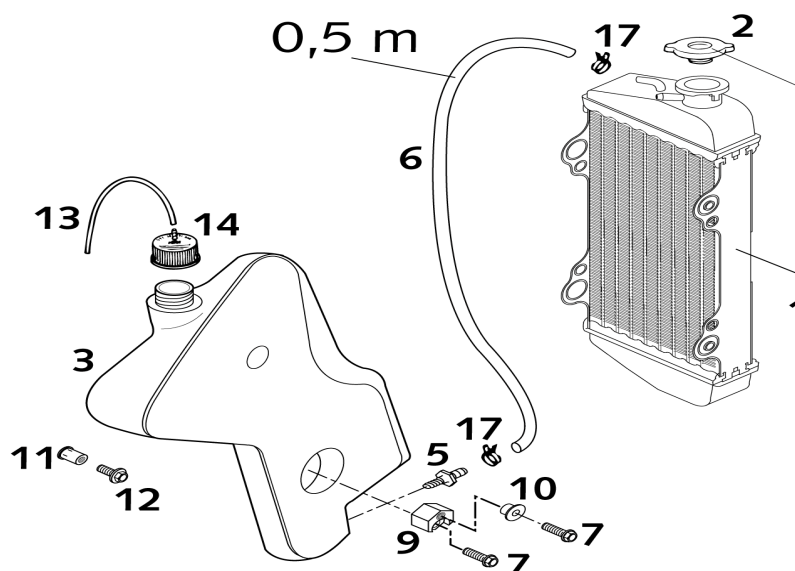


Bild	KTM-Nummer	Description
1	590.35.007.000	RADIATOR L/S(45328)RAC.2000
2	580.35.016.000	RADIATOR CAP SMALL 1,4BAR
3	523.38.161.000	ADDITIONAL TANK L/S '99
5	523.38.061.050	HOSE CONNECTION
6	583.07.016.001	FUEL HOSE VITON 6X1,5 PER/M
7	0015 060203	HH COLLAR SCREW M6X20 WS=6
9	503.35.096.000	TANK ADAPTER BUSH
10	503.08.053.000	BUSH FOR SPOILER 6X11X16X7,5
11	550.03.139.600	BLIND RIVET NUT M6X15,5 STEEL
12	0014 060203	HH COLLAR SCREW M6X20 WS=6
13	501.31.137.000	VENT HOSE 3X5X270
14	491.38.491.044	OIL TANK CAP
17	580.07.117.000	CLAMP 10107 10MM

F. Haslinger
Customer Service

W. Felber
Research & Development

Dept: CS

Nr.: 0011/30/05-E

FH

24.11.00

Subject: Maintenance recommendations for 4-stroke RACING engines series 2001**Model:** 400 / 520 SX / EXC RACING**Countries:** all

The KTM-RACING 4-stroke is designed and developed as a non compromise pro level competition racing motorcycle. In order to keep the bike ready for operation and to keep it reliable, proper maintenance is absolutely essential.

KTM recommends, to comply with the following maintenance procedures, newly defined for 2001 model year and to check and if the necessity, to replace the corresponding parts.

The following maintenance proposals are based on the experience of the last racing season and can be extended for non professional and recreational usage.

The extension of the maintenance intervals depends on constant care and intensity of usage.

Maintenance Overview:

h	400 SX	400 EXC	520 SX	520 EXC
15	Small maintenance kit		Small maintenance kit	
30	Small maintenance kit	Small maintenance kit	Small maintenance kit	Small maintenance kit
45	Small maintenance kit		Small maintenance kit	
60	Large maintenance kit	Small maintenance kit	Large maintenance kit	Small maintenance kit
75	Small maintenance kit		Small maintenance kit	
90	Small maintenance kit	Large maintenance kit	Small maintenance kit	Large maintenance kit
105	Small maintenance kit		Small maintenance kit	
120	Large maintenance kit	Small maintenance kit	Large maintenance kit	Small maintenance kit

CONTENTS OF THE MAINTAINANCE KITS:

Small maintenance kit 400/520 2001	Qty.	590.12.199.044
Inner clutch hub	1	590.32.002.000
Lining disk 1,8 mm	7	590.32.011.000
Intermediate disk 1 mm	8	590.32.010.000
Clutch cover gasket 0,5 mm	1	590.30.025.000

Large maintainance kit 400/520 2001	Qty.	590.12.199.144
Inner clutch hub	1	590.32.002.000
Lining disk 1,8 mm	7	590.32.011.000
Intermediate disk 1 mm	8	590.32.010.000
Timing chain 96 rolls	1	590.36.013.000
Timing chain tensioner cpl.	1	590.36.003.000
Cylinder Roller bearing NJ206 ET2XCS46 (crankshaft)	2	503.30.082.000
Grooved ball bearing TM16004 (balancer-shaft)	2	0625.160040
Gasket set cpl.	1	590.30.099.000

TO BE CHECKED DURING MAINTAINANCE:

- **Primary gearing** and **gearbox** need to be checked at each large maintainance for „pitting“. Replacement necessary when impressions exceed the 2/3 of tooth width.
Further on transmission gears the shifting dogs have to be checked in terms of wear.
- Grind-in **valves** during large maintainance.

For price information please call KTM spareparts department.

T. Stöcklmeier
Sales

E. Sellmaier
Quality Management

F. Haslinger
Customer Service

W. Felber
R & D

Dpt.:

No.: 0206/31/01-E

FH

24.06.2002

Customer Service

Subject:	carburetor retrofit action
Model:	250 EXC Racing 4stroke 2002 model series
Countries:	all

To improve throttle response at low RPM's, the following carburetor retrofit-procedure, including changes of setting is recommended.

- a) Replace diaphragm for accelerator pump with the new part no. **590 31 057 000**
- b) If the carburetor is still equipped with coil spring 590 31 059 000 (silver coated), that spring has to be replaced by coil spring part no. **590 31 059 100** (yellow coated).
Silver coated coil springs have been mounted in limited quantities when production has started.
- c) Mount jet needle OBEVR, part no. **590 31 134 0VR** 3rd position from top. This needle has been fitted in power restricted versions to meet homologation requirements.
- d) Main jet 160, **art. no. 545 31 623 160** (carburetor original equipped).
- d) Pilot jet 48, part no. **590 31 607 48** (included in de-restriction kit).
- e) Mixture adjusting screw 1^{1/4} turn open.

Please place your parts-order at KTM spareparts center.

When issuing a warranty claim, parts and 30 minutes labor-time will be credited.

T.Stöcklmeier
Sales

E.Sellmaier
Quality Assurance

F. Haslinger
Customer Service

W. Felber
R & D

Regarding:	Deristraction
Modell:	400 / 520 EXC Racing modelyear 2000
Countries:	all

Perform the following rebuilding work :

- 1) remove restrictor from silencer
- 2) remove filtercap from the airbox
- 3) remove slide limit stop on right side, under the plastic cover of carburetor
- 4) remove jet needle OBDVR and install OBDTM; 400: pos. IV, 520: pos. II from top
- 5) idle jet remains the same (48)
- 6) adjust idle mixture
- 7) change gear ratio of chaindrive: - 400 EXC 42/15
- 520 EXC 40/15
- competition: 48/14 or 50/14
- 8) fit longer O-ring chain

The necessary deristraction kit for the rebuilding is delivered with the new bike and is inside the documentationbag.

Please consider, that with this conversion the bikes roadworthiness will lapse. Refer to warrantyhandbook page 9.

F. Haslinger
Customer Service

W. Felber
Research & Development

Dpt.:

No.: 0203/36/01-E

FH

18.03.2002

Customer Service

Subject: Engine smoking

Model: 540 SXS

Countries: all

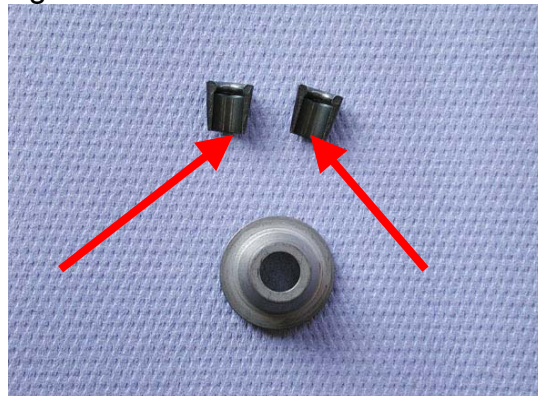
When engine smoking is detected, the reason may be damaged valve shaft seals, as a consequence of valve sleeves, not been pressed onto final seat position.

Due to this, the overlapping valve collets (see fig.A) touch and damage the valve shaft seals. To solve that problem, both valve collets have to be shortened 1,0 mm by grinding them carefully at the lower edge (see fig.B).

fig.A



fig.B



In the case of such damage, please issue a warranty claim.

T.Stöcklmeier
Sales

E.Sellmaier
Quality Assurance

F. Haslinger
Customer Service

W. Felber
R & D

Dpt.:

Nr.: 0111/36/02-E

FH

30.11.2001

Customer Service

subjekt:	automatic decompression stop-screw
model:	all 2001 4stroke Racing models
countries:	all

CORRECTION: Part number of ah-screw must read 0912 050106

To prevent engine damages, caused by a loosen stop-screw at auto decompression device, we recommend for engines in 2001 models during repairs or maintainance work (according to owners manuals) to replace ah-screw **0912 050106** (fig.A) by a new one and to replace self locking nut 0985 050003 by the **new hh-nut 0980-050003** (fig.B).



fig.A



fig.B

Both parts have to be assembled by the use of Loctite 243 and a tightening torque of 6 Nm

Both parts and a **labour rate of 30 minutes** (code T3900236200) you can claim via **KTMservice.net** system.

T.Stöcklmeier
Sales

E.Sellmaier
Quality Management

F. Haslinger
Customer Service

W. Felber
R & D

Dpt.:

No.: 0206/35/01-E

FH

25.06.2002

Customer Service

Subject:	Radiator mounting position
Model:	4 stroke Racing
Countries:	all

Tolerances in frame production can affect insufficient distance between radiators and frame tubes.

Vibrations or crashes whilst riding can cause collision between radiator and frame tubes, subsequently damage, or in worst case scenario, loss of cooling fluid can result.

To guarantee sufficient space between the components, KTM offers following parts, which can be ordered as a "set", but also as single parts, at KTM Spareparts Center.

Spacer set

Nr. 590 35 002 044

Consisting of 2 pcs. of each of below listed single items.

radiator spacer

Nr. 590 35 002 000

bushing

Nr. 546 35 036 000

HH collar screw M 6X25 WS=8

Nr. 0014060253

Please mount the "set" as shown in photo below.



T.Stöcklmeier
Sales

E.Sellmaier
Quality Management

F. Haslinger
Customer Service

W. Felber
R & D

Dept.: KD

Nr.: 0003/31/02-E

PL

14.03.00

Regarding:	Hotstart behaviour
Model:	400 / 520 SX RACING
Countries:	all

To improve the behaviour of a hotstart, we suggest to use a 48 idlejet and a setting of the mixture screw of: "one rotation open".

The carburettor needle should be set to position IV (from top) on the 400 SX and to position III (from top) on the 520 SX. To prevent the engine to quit in narrow turns the idle rpm should be risen from 1700 rpm to 1850 rpm.

With rising temperatures further adjustments to a leaner mixture can be done with the idle setting and/or the needle position.

F. Haslinger
Customer Service

W. Felber
Research & Development

Alteration:



Please note at some models (125 SX, 200 SX, 525 SX Racing 2003), that the brake piston diameter is either 26 mm or 28 mm.

Before ordering please make sure which diameter your brake system has.

KTM-Numbers:

Brake system rear 26 mm:

503.13.080.244	BRAKE CALIPER REAR CPL. 26 MM 03
503.13.081.200	REPAIR KIT SEALING RINGS 26 MM
503.13.083.200	BRAKE PISTON 26 MM

Brake system rear 28 mm:

503.13.080.144	BRAKE CALIPER REAR CPL. 28 MM 01
503.13.081.100	REPAIR KIT SEALING RINGS 28 MM
503.13.083.100	BRAKE PISTON 28 MM

Dpt.:

No.: 0302/39/01-E_3

FH

17.02.2003

Customer Service

Subject:	Over-revving and subsequently engine damages
Model:	525 SX
Countries:	BE, CA, CH, DK, EE, FI, FR, HU, IS, LV, NL, NO, PL, RU, SE, SK, UA,

Dear KTM-Distributor!

We have found, that it is possible to over-rev the 525SX engine and this will cause engine damage.

To eliminate the possibility of over-revving and to maintain the present performance, the 2003 525SX models must be retrofitted with KTM CDI-box **590 39 031 100** in combination with the cable adapter **590 39 033 000**.

Therefore the equivalent quantity of these parts, appropriate to the number of bikes delivered to your market, have been prepared for you at KTM spareparts center.

The procedure is as follows:

- a) KTM spareparts center will ship to you and invoice above mentioned parts for all 525SX bikes you received.
- b) You arrange the retrofit on the bikes due to your priorities and
- c) issue, or advise to issue warranty claims in KTMservice.net for every individual bike.
- d) KTM-SMC will credit the parts-cost and the equivalent for 25 minutes labor.
Labor code T3900211230.

T.Stöcklmeier
Sales

E.Sellmaier
Quality Assurance

F. Haslinger
Customer Service

W. Felber
R & D

Dpt.:

No.: 0301/32/01-E

FH

27.01.2003

Customer Service

Subject:	Clutch plates kit
Model:	450 SX and 525 SX / 2003
Countries:	All

To improve the damping function of the clutch and subsequently careful treatment of the gearbox against pittings formation, during service, maintainance or repairs, we recommend to equip the clutch discs kit with:

6 pcs. intermediate discs 1mm art.nr. 590 32 010 100 (former 4 pcs.) plus
2 pcs. intermediate discs 1,4mm art.nr. 590 32 010 200 (former 4 pcs.)

and position them as following.

3 pcs. intermediate discs 1 mm

2 pcs. intermediate discs 1,4 mm

3 pcs. intermediate discs 1 mm

T.Stöcklmeier
Sales

E.Sellmaier
Quality Assurance

F. Haslinger
Customer Service

W. Felber
R & D

Dpt.:

No.: 0304/36/01-E

FH

14.04.2003

Customer Service

Subject:	Cylinderhead
Model:	450 SX model 2003
Countries:	all

Dear KTM Distributor!

In case of a failure on the valve drive (valve, rocker arm, adjusting screw, valve spring; spring retainer) the complete cylinder head needs to be replaced! This is a **temporary limited** action, but is necessary as the best possible repair for our customers and to allow a detailed failure analyses.

To assure a quick repair, complete cylinder heads art.no. **594 36 020 066**, containing valves, springs, rocker arms, camshaft, etc. are prepared at KTM spare parts centre.

Please note, before placing an order or to issuing a warranty claim it is necessary to update the price file in the Service.net.

After receipt of the new cylinder head, the damaged cylinder head has to be returned to KTM Austria, including valves, springs, spring retainers, rocker arms, adjusting screws and camshaft.

For reimbursement of the arisen costs a warranty claim can be issued. Following parts and labour costs will be credited:

labour time cylinder head cpl. replacement T3900230050

1 x cylinder head cpl. 59436020066

1 x cylinder head gasket 95,3 mm 59030036000

1 x water pump cover gasket 59035053000

1 x gasket exhaust flange 59036041000

2 x valve cover gasket 58036053000

In case of consequential damage all further needed parts have to be returned and the labour has to be adapted according to the flat rate manual.

Claims can only be approved when the complete cylinder head was received at KTM Austria.

T.Stöcklmeier
Sales

E.Sellmaier
Quality Assurance

F. Haslinger
Customer Service

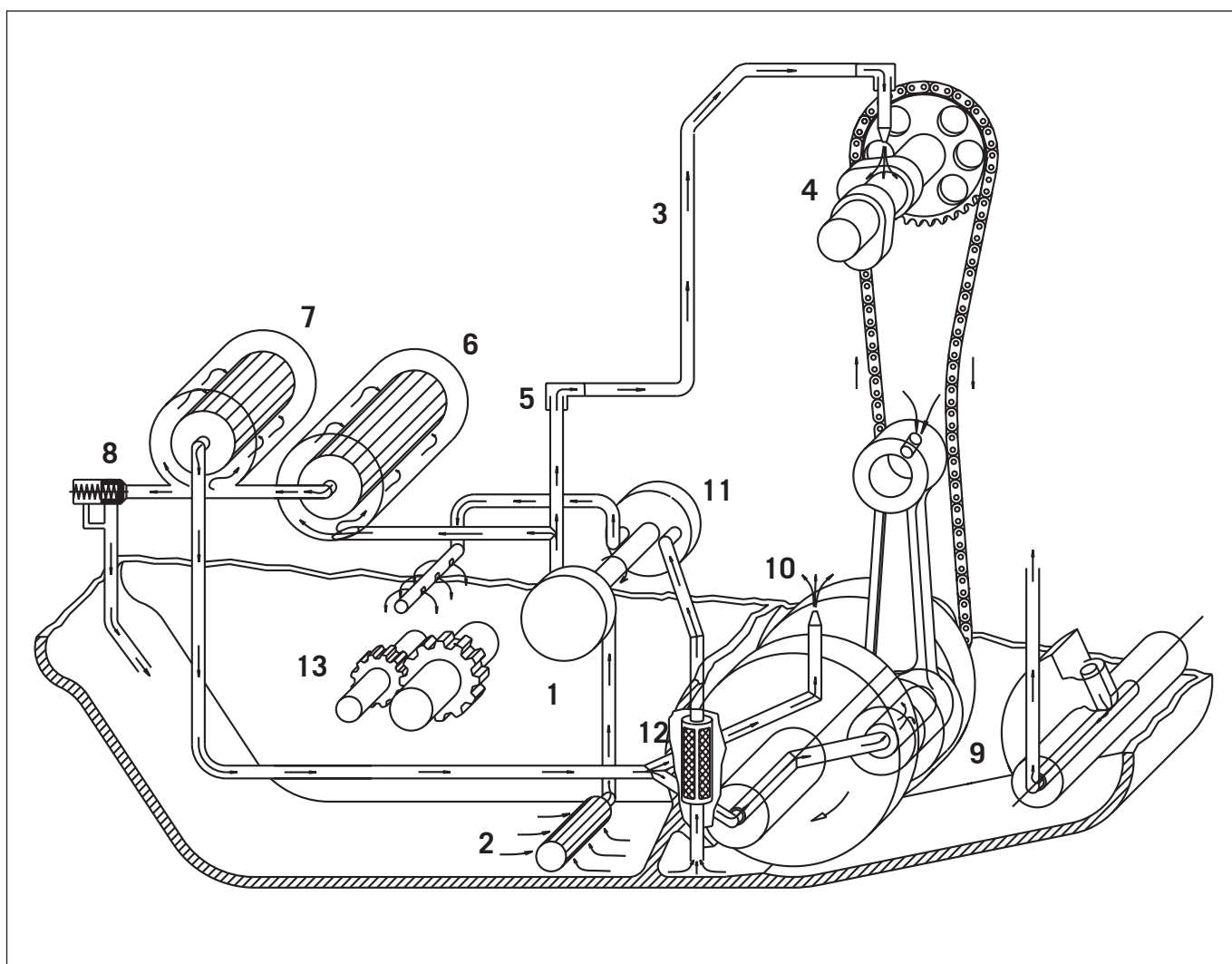
W. Felber
R & D

GENERAL INFORMATION

2

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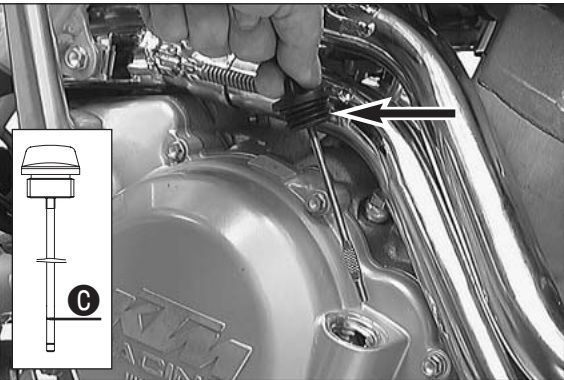
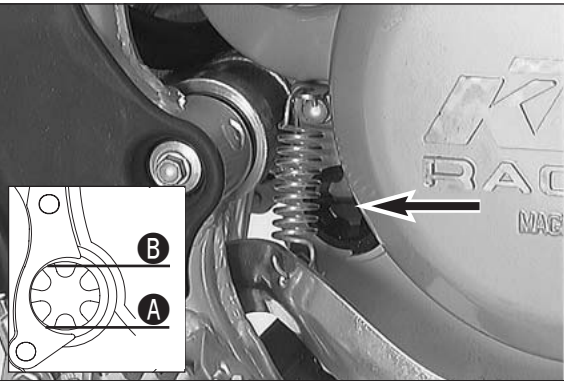
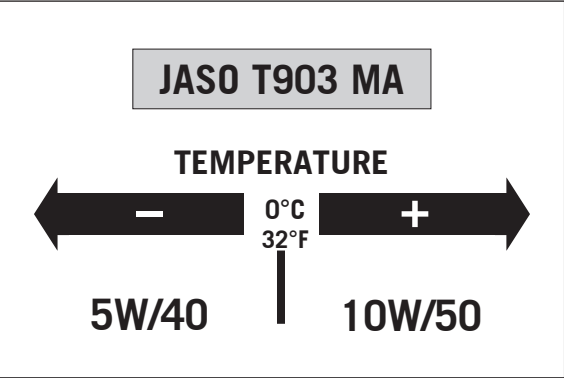


Oil circuit

Via the long oil screen ②, the oil pump ① draws engine oil from the oil sump of the transmission. This engine oil flows through an oil line ③ into the cylinder head for camshaft lubrication ④; the oil quantity is controlled by the jet bolt ⑤. An oil duct branches off to the long oil filter ⑥ where the coarser particles contained in the engine oil are filtered away. Then, the engine oil arrives at the short oil filter ⑦ which also filters the fine particles.

Now, the purified engine oil is pumped past the bypass valve ⑧ to the conrod bearing ⑨ and sprayed from below onto the piston through a nozzle ⑩.

The second oil pump ⑪ draws the engine oil via the short oil screen ⑫ out of the crankcase, thereby lubricating the transmission gears ⑬.



Engine oil

Automobile engine oil used to be used for four-stroke motorcycles before there were separate motorcycle specifications. Different technical developments made it necessary to have a separate specification for four-stroke motorcycles - the JASO T903 MA standard. Whereas car engines require long changing intervals, motorcycle engines require a higher power output at higher speeds. Most motorcycle engines also use the same oil to lubricate the transmission and the clutch. The JASO MA standard responds to these special requirements. Only use fully synthetic engine oils that meet the JASO MA quality requirements (see information on the can). KTM recommends Motorex Power Synt 4T in the 10W/50 viscosity (for temperatures over 0°C, 32°F) or 5W/40 (for temperatures under 0°C, 32°F).

Checking the engine oil level

The engine oil level can be checked with the engine being either warm or cold. Place the motorcycle in an upright position and on a horizontal surface (not on the side stand).

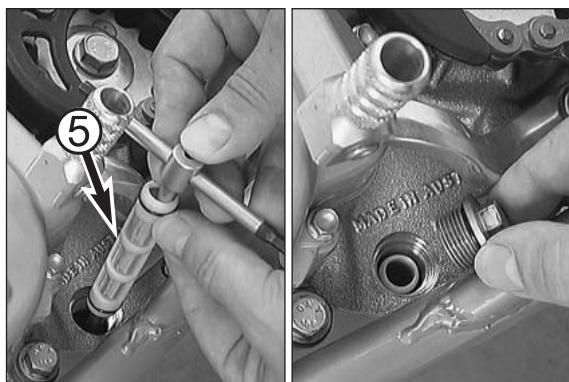
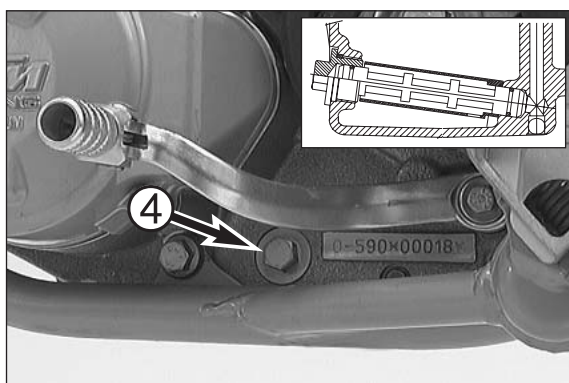
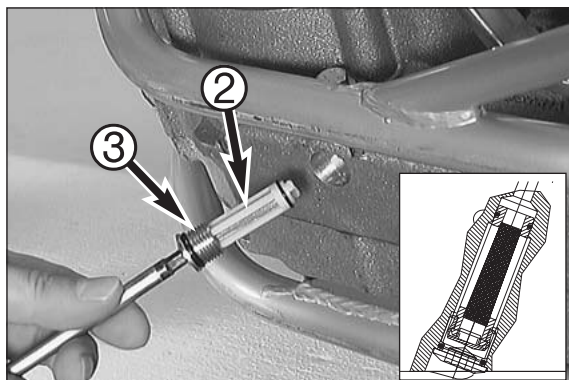
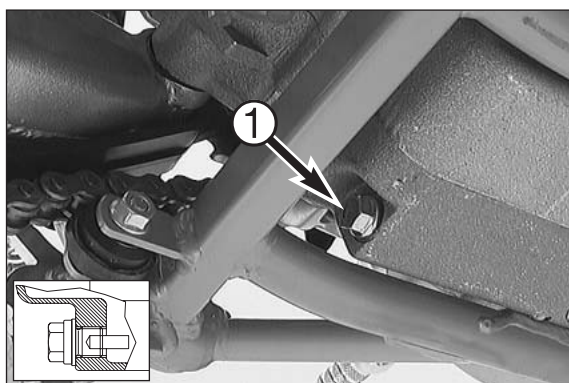
If the engine is cold, the engine oil must be visible at the lower edge of the inspection glass **A**.

If the engine is warm, the engine oil must be visible up to the upper edge of the inspection glass **B**.
Replenish the engine oil, if necessary.

! CAUTION !
INSUFFICIENT AMOUNTS OR LOW-GRADE ENGINE OIL LEAD TO PREMATURE WEAR OF THE ENGINE.

NOTE: Engines up to the 2001 model have a sight glass and an oil dipstick. If the inspection glass is heavily soiled (e.g. after a race in muddy terrain), the engine oil level can also be measured with the oil dipstick. For this purpose, unscrew the dipstick and wipe it clean with a cloth. Screw the dipstick back in and screw it out again. If the engine is warm, the oil level should be near the MAX mark **C**.

- Check engine for leaks.



Changing the engine oil

NOTE: When changing the engine oil, it is necessary to clean the short and long oil screens and to replace both oil filters.

Engine oil has be changed with the engine being at an operating temperature.

⚠ WARNING ⚠

AN ENGINE AT OPERATING TEMPERATURE AND THE ENGINE OIL IT CONTAINS ARE VERY HOT - DO NOT BURN OR SCALD YOURSELF!

- Place the motorcycle on a horizontal surface, remove the plug ❶ and allow the oil to drain into a receptacle.
- Clean plug (with magnet) thoroughly.
- Once the entire oil has been drained, clean the sealing surface, mount the plug together with the sealing ring and tighten it to 20 Nm.

CLEANING THE SHORT OIL SCREEN

NOTE: The short oil screen ❷ is accommodated in the hex-socket plug ❸ on the engine bottom.

- Insert a pin-type key into the plug and tap on the key a few times with a hammer in order to relieve the stress acting on the plug. Dismount the oil screen, clean the components thoroughly and blow compressed air through them. Check the O-rings for damage and, if necessary, replace them. Mount the oil screen together with the plug again and tighten the plug to 10 Nm.

CLEANING THE LONG OIL SCREEN

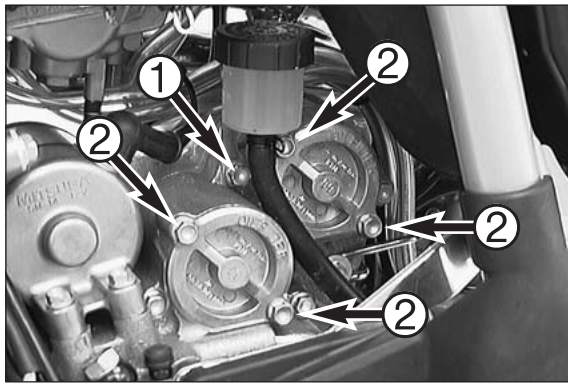
NOTE: The long oil screen is accommodated in the hexagon plug ❹ adjacent the engine number.

- Dismount the plug together with the oil screen, clean the components thoroughly and blow compressed air through them. Check the O-rings for damage and, if necessary, replace them.

- To mount the long oil screen ❺, place it on an approx. 300 mm/ 11.8 in long pin-type key or a similar tool.
- Insert the pin-type key through the opening into the bore of the opposite engine casing wall. Then, push the oil screen into the engine casing as far as possible.
- Remove the pin-type key, mount the plug and tighten it to 15 Nm.

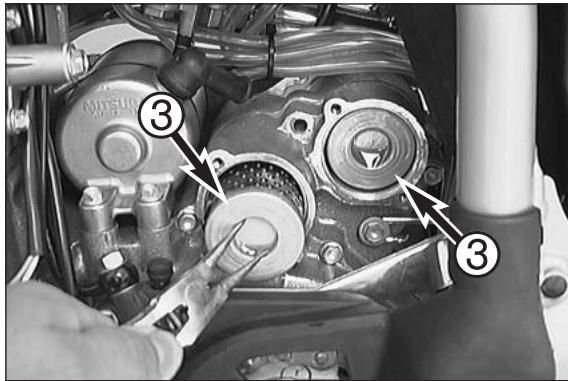
! CAUTION !

THE OIL SCREEN IS MOUNTED SLIGHTLY DOWNWARDS, IF INCORRECTLY FITTED, THE SCREEN LOOSES ITS FUNCTION AND THIS CAN CAUSE INCREASED ENGINE WEAR.

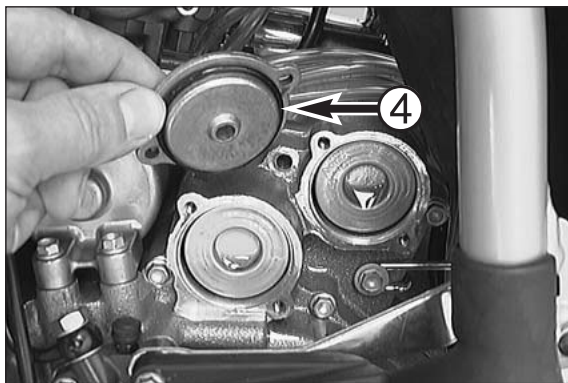


Changing the oil filters

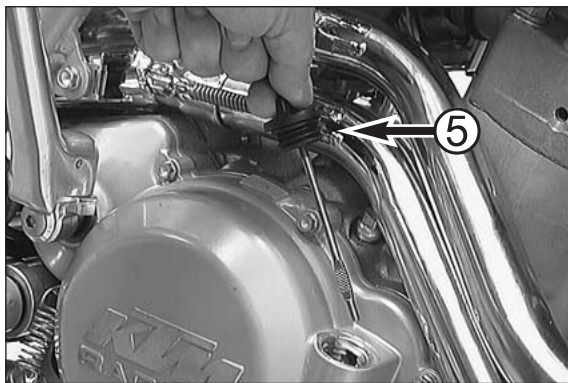
- Remove the bolt **1** and swing the brake fluid container sideward. Place a receptacle underneath the engine to collect the drained oil. Remove the 4 bolts **2** and dismount the two oil filter covers.



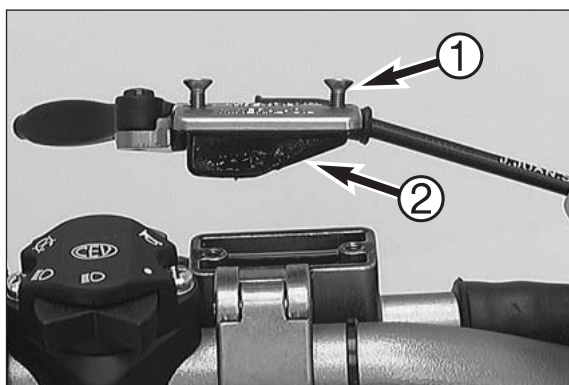
- Using circlip pliers, you may now pull the oil-filter inserts **3** out of the housing.
- Clean the oil filter cover, the sealing surfaces of the O-rings and the engine casing. Check the O-rings of the oil filter covers for damage and, if necessary, replace them.



- Put the motorcycle on its side and fill the oil filter housings about halfway with engine oil. Insert the long oil filter at the front and the short oil filter at the back of the housing.
- Grease the O-rings **4** of the oil filter covers and mount the cover. Mount the bolts and tighten them to 6 Nm.
- Position the brake fluid container and tighten the bolt to 8 Nm.



- Return the motorcycle to an upright position.
- Remove the oil dipstick **5** at the clutch cover and fill in 1.2 liters of fully synthetic engine oil (Motorex Power Synt. 4T).
- Start the engine and check all screwed connections and oil filter covers for leaks.
- Finally, check the engine oil level and, if necessary, correct it.

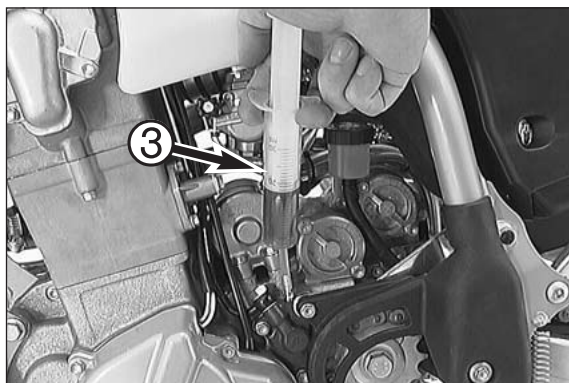


Checking the oil level of the hydraulic clutch

To check the oil level in the master cylinder of the clutch remove the cover. For this purpose, remove bolts ① and cover together with the rubber boot ②. The oil level in the horizontal-standing master cylinder should be 4 mm (0,157 in) below the upper edge. If necessary add SAE 10 biodegradable hydraulic oil (Motorex Kupplungs-Fluid 75).

! **CAUTION** !

ONLY USE SAE 10 BIODEGRADABLE HYDRAULIC OIL (MOTOREX KUPPLUNGS-FLUID 75) TO REFILL THE MASTER CYLINDER. NEVER USE BRAKE FLUID!



Bleeding of the hydraulic clutch

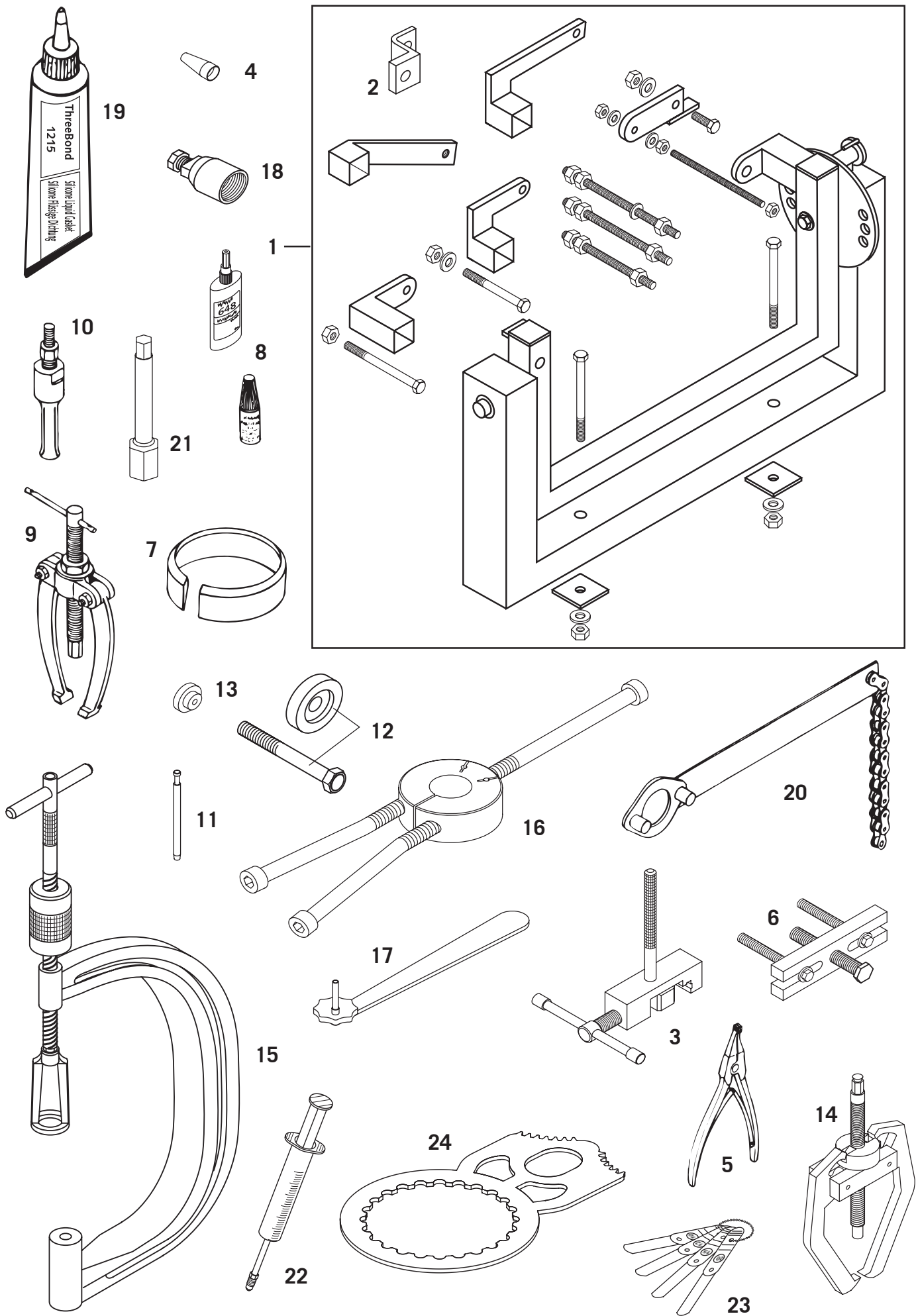
- For bleeding, the cover of the master cylinder of the clutch needs to be removed. For this purpose, remove screws ① and take off cover together with rubber bellows ②.
- At the slave cylinder of the clutch, remove the bleeder nipple. At its place, mount the bleeder syringe ③ which is filled with biodegradable hydraulic oil (Motorex Kupplungs-Fluid 75).

- Refill oil, until oil is discharged from the bore ① of the master cylinder in a bubble-free state. Make sure that the oil does not overflow.

! **CAUTION** !

HAVING COMPLETED THE BLEEDING PROCEDURE, YOU HAVE TO VERIFY THAT THE OIL LEVEL IN THE MASTER CYLINDER IS CORRECT. FOR FILLING OF THE MASTER CYLINDER, USE SAE 10 BIODEGRADABLE HYDRAULIC OIL (MOTOREX KUPPLUNGS-FLUID 75) ONLY. NEVER USE BRAKE FLUID NOR MIX BIODEGRADABLE HYDRAULIC OILS WITH MINERAL OILS.





SPECIAL TOOLS – ENGINE

FIG	PART NO.	DESCRIPTION
1	560.12.001.000	Universal engine work stand
2	590.29.002.000	Engine holder for engine work stand
3	590.29.020.000	Rivetting tool for steering chain
4	590.29.005.010	Mounting sleeve for shaft seal ring water pump
5	510.12.011.000	Circlip pliers
6	590.29.021.044	Puller for driving hub and primary gear
7	598.29.015.075	Piston ring spanner Ø 75 mm
	580.12.015.089	Piston ring spanner Ø 89 mm
	580.12.015.095	Piston ring spanner Ø 95 mm
8	6 899 785	Loctite 243 blue 6 cm ³
	584.29.059.000	Loctite 648 green 20 ml
9	151.12.017.000	Gear puller
10	151.12.018.000	Internal gear puller 12-16 mm
	151.12.018.100	Internal gear puller 18-23 mm
11	590.29.026.006	Limit plug gauge 6.05 mm
12	590.29.035.000	Mounting sleeve for driving pin
13	590.29.036.000	Protection sleeve for primary gear
14	590.29.033.000	Puller for camshaft bearings
15	590.29.019.000	Valve spring mounter
16	584.29.037.037	Mounting tool for inner rings of crankshaft bearings
17	590.29.034.000	Wrench for mixture regulating screw
18	580.12.009.000	Magneto extractor
19	309098	Seal (Three-Bond)
20	510.12.012.000	Chain sprocket holder
21	590.29.072.000	Spark plug wrench 16 mm
22	503.29.050.000	Bleeding syringe for hydraulic clutch
23	590.29.041.000	Feeler gauge for valve clearance
24	590.29.003.100	Clutch holder

CLEANING

Clean your motorcycle regularly in order to maintain the beauty of its plastic surfaces.

The best manner would be to use warm water that has been mixed with a normal brand-name washing detergent and a sponge. The hard dirt can be removed before washing with the help of a soft water jet.

!

CAUTION

!

NEVER CLEAN YOUR MOTORCYCLE WITH A HIGH-PRESSURED CLEANER OR A HIGH-PRESSURED WATER JET. THE WATER COULD OTHERWISE RUN INTO THE ELECTRICAL COMPONENTS, CONNECTORS, SHEATHED CABLES, BEARINGS, CARBURETOR, ETC. AND CAUSE DISTURBANCES OR LEAD TO A PREMATURE DESTRUCTION OF THESE PARTS.

- You should use normal brand-name detergents to clean the motorcycle. Especially dirty parts should be cleaned additionally with the help of a paint brush.
- Before cleaning with water, plug the exhaust pipe to prevent water ingress.
- After the motorcycle has been rinsed with a soft water jet, it should be dried by air pressure and a cloth. Drain the float chamber of the carburetor. Then take a short drive until the engine has reached the working temperature and also apply the brakes. By warming these components, the residual water can evaporate from inaccessible parts of the engine and the brakes.
- Slide back the protective covers on the handlebar-mounted instruments so that any water that may have seeped into this part of the motorcycle is allowed to evaporate.
- Once the motorcycle has cooled down, oil or grease all sliding and bearing points. Treat the chain with a chain spray. Also oil the fuel tap.
- To avoid malfunctioning of the electric system, you should treat the emergency-OFF switch, short-circuit button, light switch and socket connectors with a contact spray.

CONSERVATION FOR WINTER OPERATION

In the event that the motorcycle is also used in winter and on roads where one has to expect salt spraying, you will have to take precautions against the aggressive road salt.

- clean motorcycle thoroughly and let it dry after each ride.
- treat engine, carburetor, swing arm, and all other bare or galvanized parts (except for brake discs) with a wax-based anti-corrosion agent.

⚠

WARNING

⚠

KEEP ANTI-CORROSION AGENT FROM GETTING INTO CONTACT WITH THE BRAKE DISCS, FOR OTHERWISE THIS WILL SIGNIFICANTLY REDUCE THE BRAKING POWER.

!

CAUTION

!

AFTER RIDES ON SALTED ROADS, CLEAN MOTORCYCLE THOROUGHLY WITH COLD WATER AND LET IT DRY WELL!

STORAGE

Should you desire to make a pause over a longer space of time, please observe the following instructions:

- Clean motorcycle thoroughly.
- Change engine oil, short and long oil filters (old engine oil contains aggressive contaminants).
- Check antifreeze and amount of cooling liquid.
- Warm up the engine once again, close the fuel cock and wait until the engine dies. Then open the drain plug from the float chamber to remove the remaining fuel.
- Remove spark plug and fill in approx. 5 cc of engine oil into the cylinder through the opening. Actuate kick-starter 10 times in order to distribute the oil onto the cylinder walls and mount the spark plug.
- Set piston to compression so that the valves will be closed (slowly operate the kickstarter until you can hear the automatic decompressor click (release)).
- Let fuel flow out of tank into an appropriate container.
- Correct tire pressure.
- Lubricate pivot points of the control levers, footrests, etc. as well as the chain.
- Service the shock absorber linkage.
- Disassemble and charge battery.
- The storage place should be dry and not subject to excessive temperature fluctuations.
- Cover the motorcycle with an air permeated tarpaulin or blanket. Do not use non air permeable materials as any humidity may not be able to escape and could cause corrosion.

!

CAUTION

!

DO NOT LET THE ENGINE RUN FOR A SHORT TIME DURING THE STORAGE PERIOD. THE ENGINE WOULD NOT GET WARMED UP ENOUGH AND THE THUS DEVELOPED STEAM WOULD CONDENSE DURING THE COMBUSTION PROCESS AND CAUSE THE VALVES AND EXHAUST TO RUST.

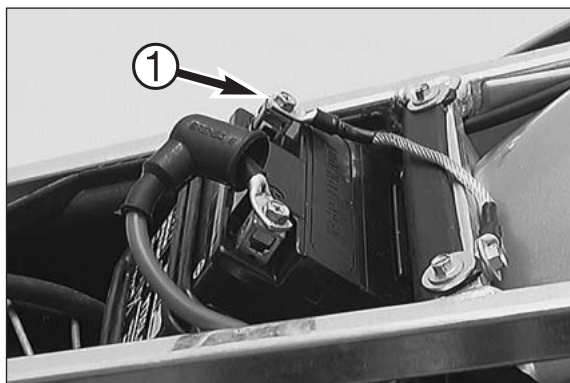
RE-INITIATION AFTER TIME OF STORAGE

- Mount the charged battery (match polarity).
- Fill up tank with fresh fuel.
- Check motorcycle as before each start (see driving instructions).
- Take a short, careful test ride first.

DISMOUNTING AND MOUNTING THE ENGINE 3

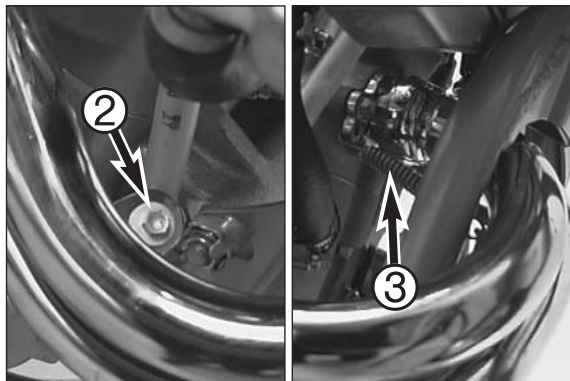
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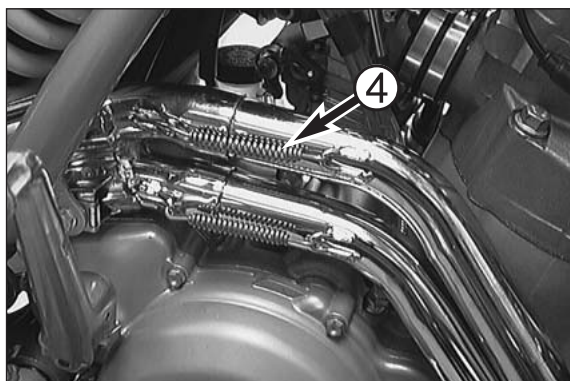


Dismounting the engine

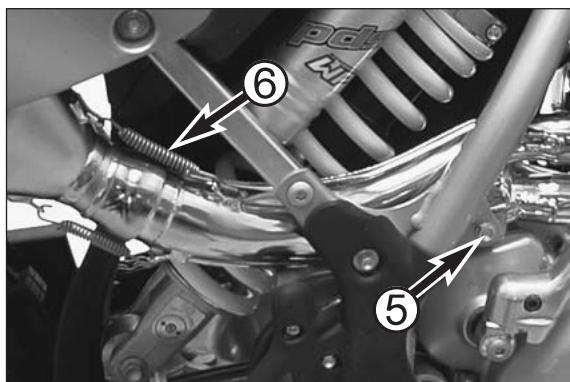
- Clean the motorcycle thoroughly and prop it up on a stable stand.
- Dismount the seat and the tank with spoilers.
- Disconnect the ground cable ❶ of the battery.



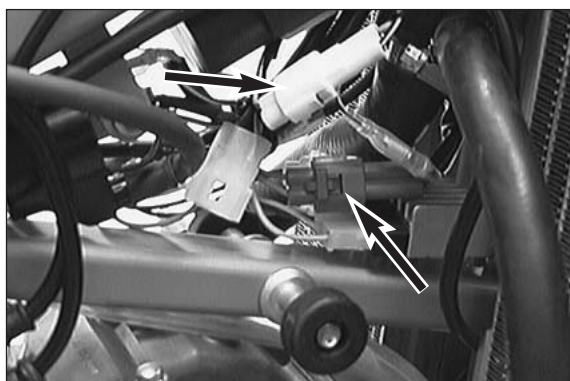
- Remove the screw ❷ and detach the 2 tension springs ❸.



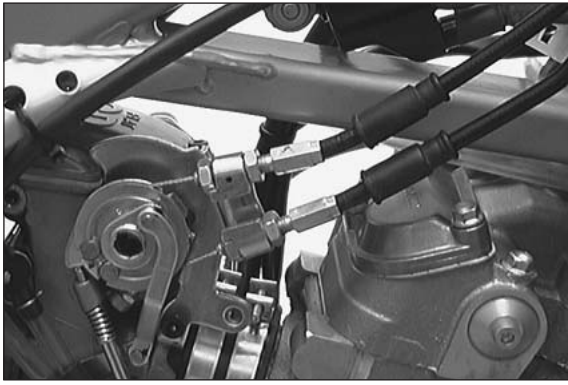
- Detach the 2 tension springs ❹, pull exhaust pipes forward and take them off the vehicle.



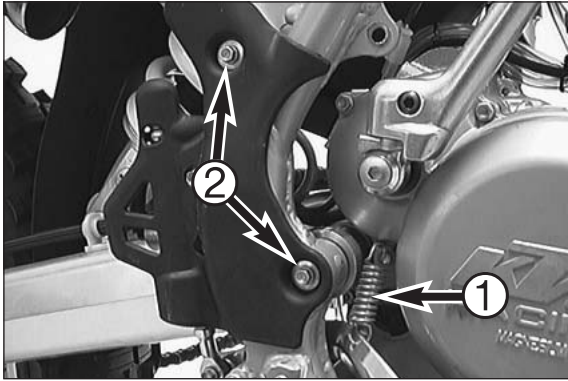
- Detach the 2 tension springs ❻ and remove the screw ❺.
- Pull the intermediate pipe forward and take it off the vehicle.



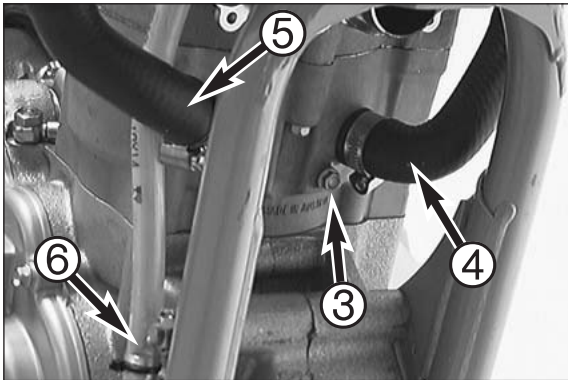
- Disconnect all plug-and-socket connections of the ignition system.
- Unhitch the cable of the hand decompressor at the engine.
- Pull out the spark plug connector.



- Remove the carburetor cover and unhitch both throttle cables.



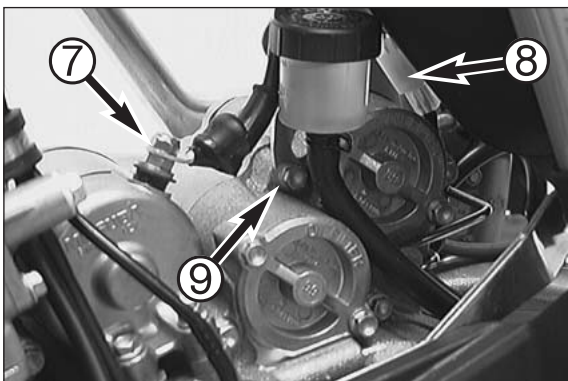
- Detach the return spring ❶ of the footbrake pedal.
- Remove the 2 screws ❷ and take off the frame cover.



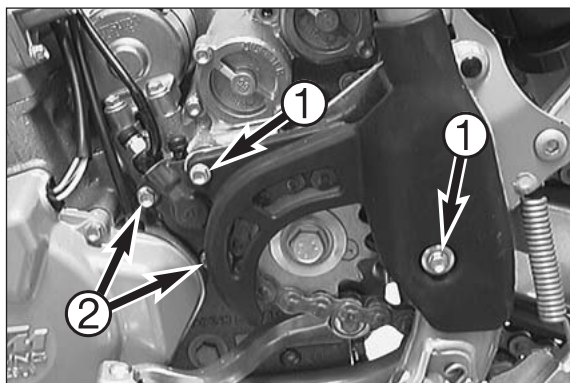
- Open the radiator cap.
- Remove the screw ❸ at the cylinder together with the sealing ring and drain the coolant into a receptacle.
- Disconnect the water hoses ❹ and ❺.
- Disconnect the hose of the engine ventilation system ❻.



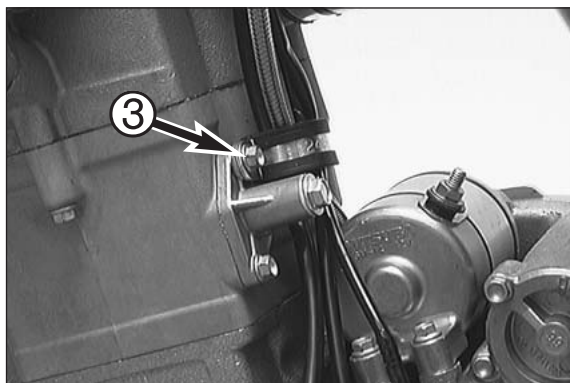
- Disconnect the plug-in connection from the throttle-valve sensor.
- Loosen the front and rear hose clamps of the carburetor, pull the carburetor backward and pivot it out of the rubber sleeve at the front.
- Take the carburetor off the vehicle.



- Disconnect the cable ❷ from the E-starter motor.
- Disconnect the plug-and-socket connection ❸.
- Remove the screw ❹ and swing the brake-fluid container sideward.

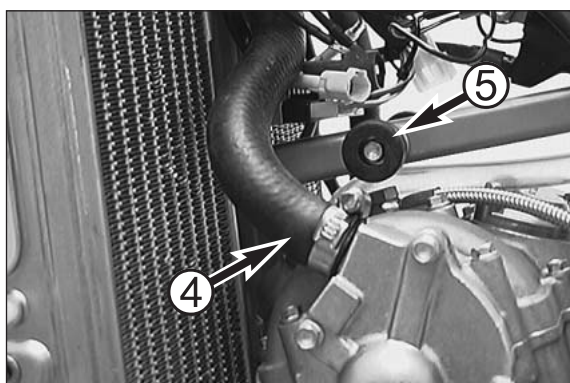


- Remove the bolts **1** and take off the sprocket cover.
- Remove the 2 bolts **2** of the clutch slave cylinder and pull the clutch slave cylinder off the casing.
- Swing the chain damper plate backwards.
- Open the chain joint and remove the chain from the vehicle.

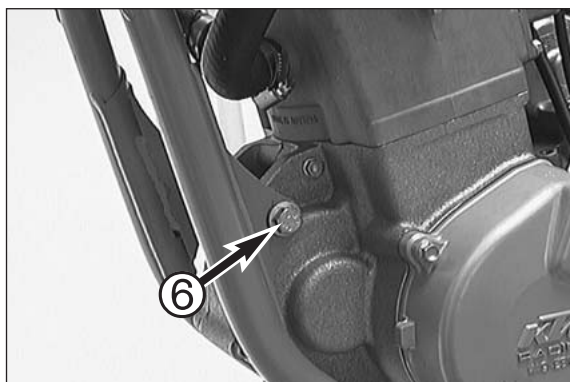


- Remove the bolt **3** and take off the cable clip.

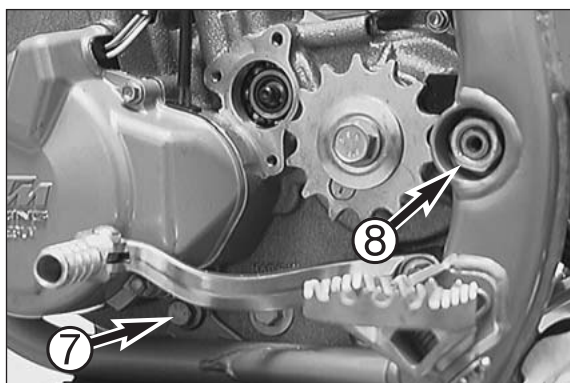
NOTE: From Model 2001 onwards a cable tie is mounted instead of the cable clip.



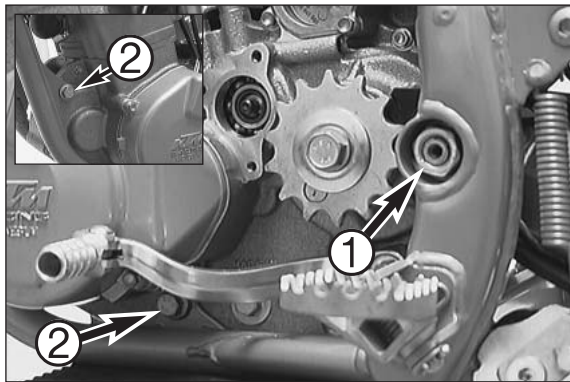
- Disconnect the radiator hose **4** and dismount the tank roller **5**.



- Dismount the front engine mounting bolt **6**.

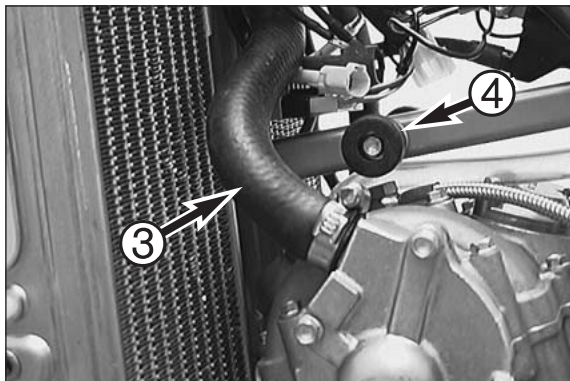


- Remove the engine mounting bolt **7** and the hex nut **8**.
- Dismount the swing arm pivot and pull the swing arm backwards.
- Lift the engine out of the frame.

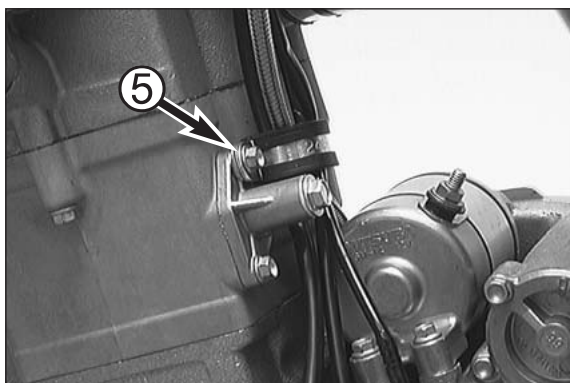


Mounting the engine

- Lift the engine into the frame and move into the correct position.
- Slightly grease the swing arm bolt and mount the hexagon nut ① but do not tighten yet.
- Slightly grease both engine fixing screws ② and mount to 60 Nm.
- Tighten the hexagon nut ① to 100 Nm.

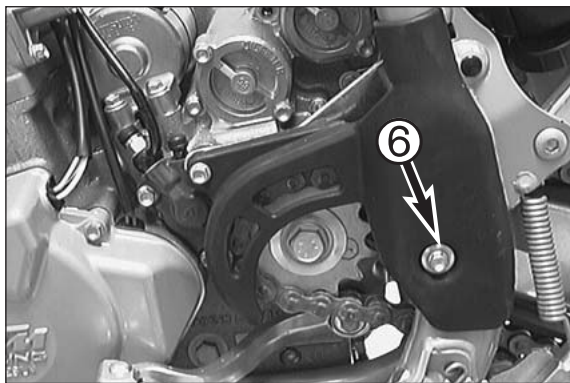


- Mount the radiator hose ③ and the tank roller ④.



- Fasten the cable clip ⑤.

NOTE: From Model 2001 onwards a cable tie is mounted instead of the cable clip.



- Mount the chain.

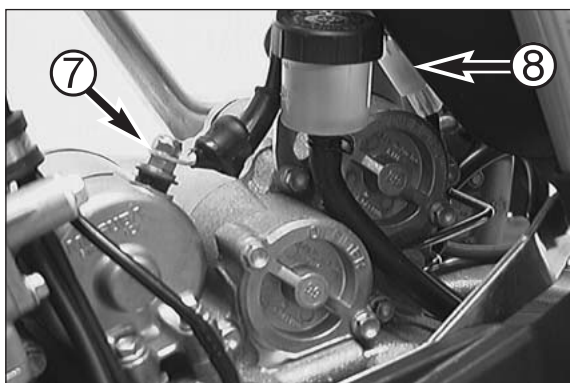
!

CAUTION

!

WHEN MOUNTING THE CHAIN JOINT MAKE SURE THAT THE CLOSED SIDE OF THE RETAINER POINTS IN THE RUNNING DIRECTION.

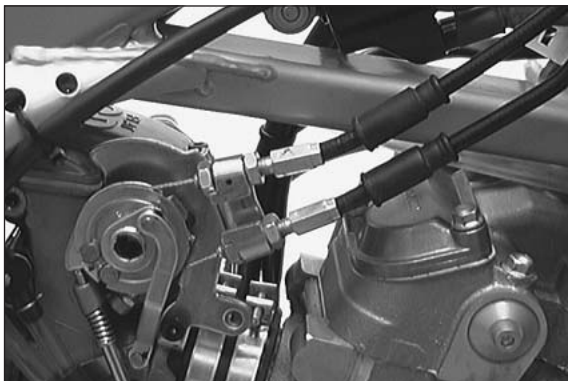
- Mount the clutch slave cylinder together with the chain damping sheet and the chainguard and tighten the three screws to 10 Nm.
- Tighten the screw ⑥.



- Connect the cable ⑦ to the starter.
- Connect the plug connector ⑧.
- Mount the brake fluid reservoir.



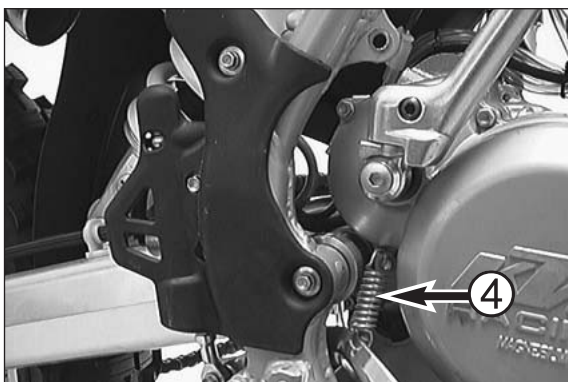
- Insert the rear end of the carburetor in the carburetor connection boot and the front end in the intake flange.
- Mount and tighten both hose clamps.



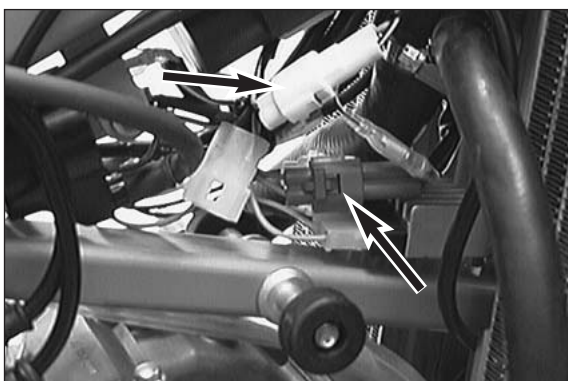
- Attach both throttle cables and mount the carburetor cover.
- Connect the plug connector on the throttle sensor.



- Connect the water hoses ① and ②.
- Mount the engine bleeder hose ③.



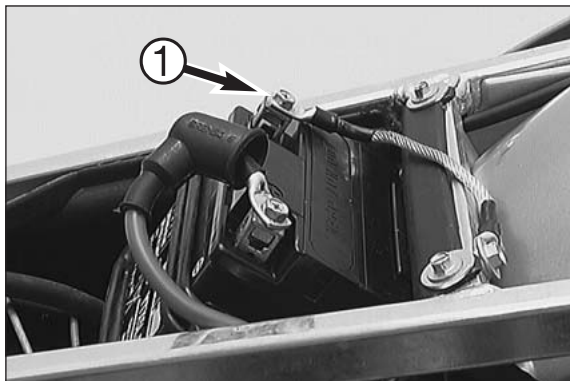
- Attach the spring ④ on the foot brake lever to the clutch cover.
- Mount the brake cylinder cover.



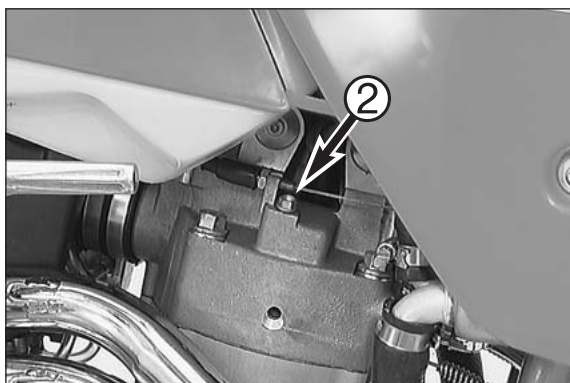
- Connect all the plug connectors in the ignition system.
- Attach the spark plug connector to the spark plug.
- Attach the cable on the hand decompression lever to the engine.



- Mount the exhaust system.



- Connect the ground wire ❶ to the battery.
- Mount the seat and tank together with the spoilers.

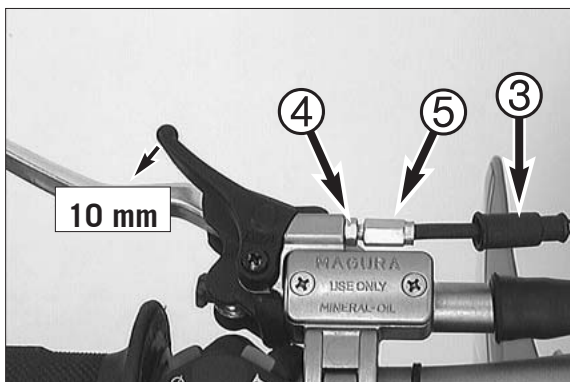


Bleeding the cooling system

To bleed the cooling system, fill in approx. 0.8 liters (0.2 US gallons) of coolant and remove the bleeder bolt ❷. Do not reinstall the bleeder bolt until coolant escapes at the bore without any bubbles.

Then, fill in the coolant until it reaches a level about 10 mm above the radiator fins.

After a short ride, check the coolant level once more.



Checking the adjustment of the hand decompression release cable

Start the engine and, at idling speed, slowly pull the hand decompression lever until you can feel the thumping of the rocker arm on the lever. The backlash until said thumping should be approx. 10 mm, measured at the lever's outer end. If necessary, correct this backlash.

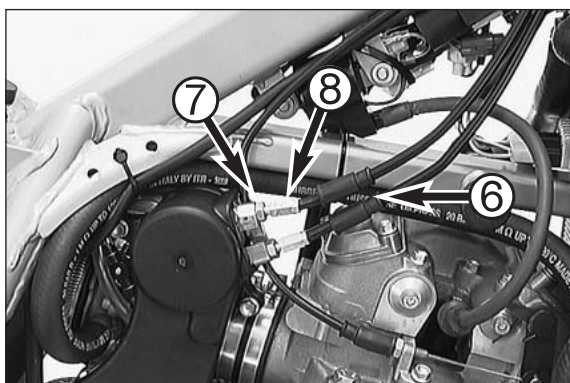
To adjust move back the protective cover ❸, loosen the counter nut ❹ and correct the adjustment screw ❺ accordingly. Tighten counter nut and push back protective cover.

!

CAUTION

!

IF THERE IS NO PLAY IN THE DECO-LEVER, THIS CAN RESULT IN ENGINE DAMAGE.



Adjusting the throttle cables

The throttle grip should always provide for a backlash of 3-5 mm. Besides, with the engine running, the idling speed must not change if you turn the handlebar all the way to the left or right.

To adjust the throttle cables, dismount the seat and the tank together with spoilers. Slide back the protection cover ❻. Loosen the counter nut ❼ and turn the adjusting screw ❸ accordingly. Turning the adjusting screw counterclockwise will reduce the backlash, turning the adjusting screw clockwise will increase the backlash.

Tighten the counter nut and check whether the throttle grip can be actuated smoothly. Mount tank and seat.

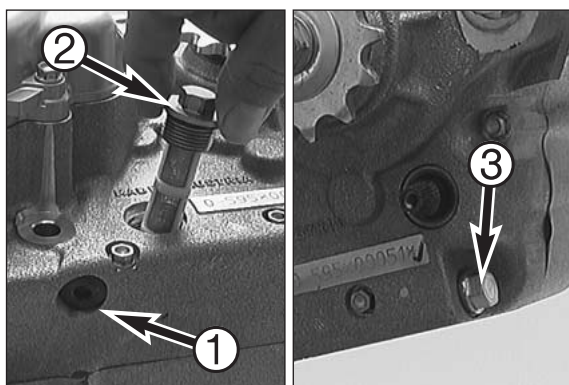
- After a short, careful test ride, check engine oil and coolant level once more.

DISMANTLING THE ENGINE

4

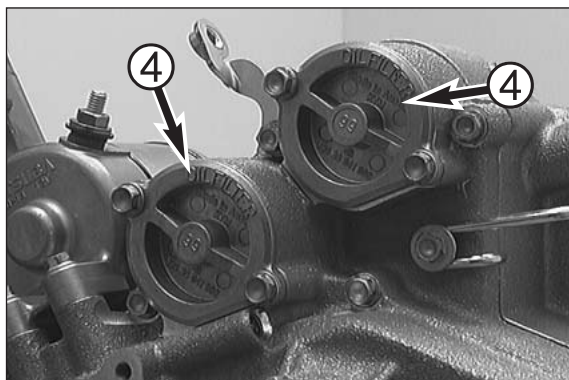
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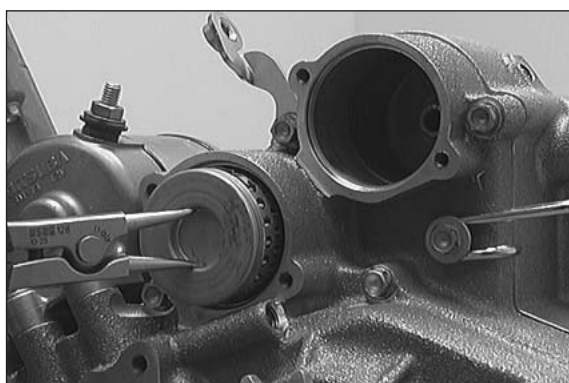
Draining the engine oil

- Remove the bolts ①, ②, and ③, and drain the engine oil into a receptacle.
- Remove kickstart and shift lever.



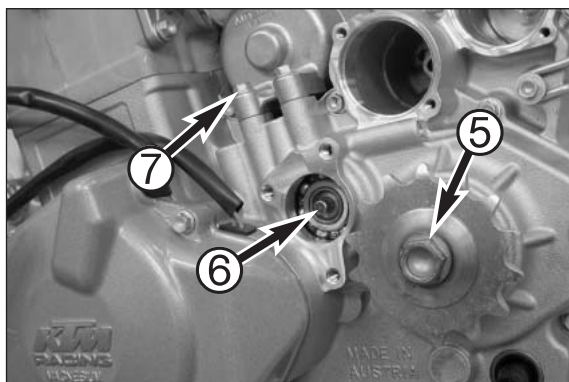
Dismounting the oil filter

- Unfasten the 4 bolts and remove both oil filter covers ④.



- Pull the 2 oil filters out of the housing.

NOTE: To pull out the oil filters, you should use circlip pliers (see photo).



Dismounting the chain wheel

- Remove collar bolt ⑤ and disc spring.
- Take the chain wheel off the countershaft.
- Pull the spacer bushing off the countershaft.

NOTE: If the transmission and clutch of the engine are okay, you can engage a gear in order to block the countershaft (force transmission to the blocked crankshaft does exist).

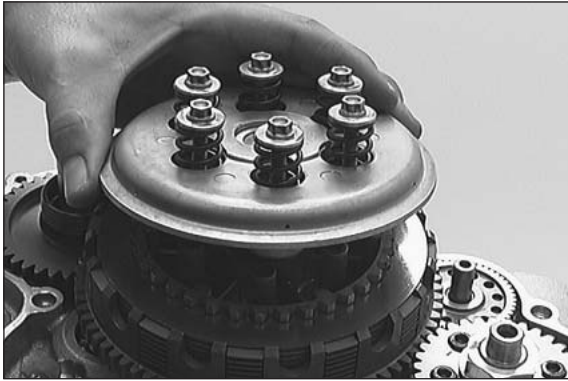
If the countershaft cannot be blocked as described above, you have to use a holding spanner to steady the chain-wheel in order to unfasten the collar bolt.

- Pull push rod ⑥ out of the main shaft.
- Loosen the 2 bolts ⑦ and dismount the E-starter motor.

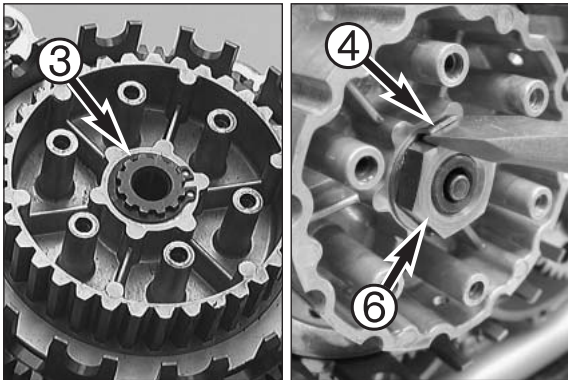
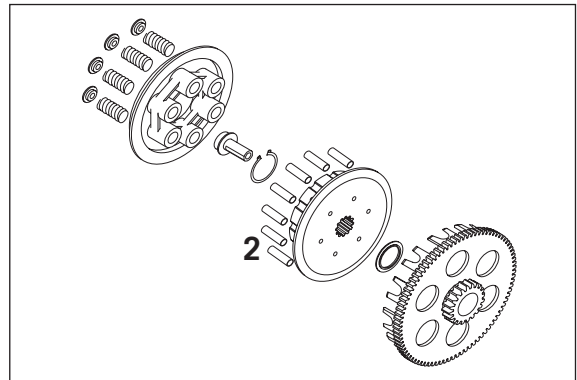


Disassembling the clutch

- Loosen all bolts of the clutch cover and dismount clutch cover together with gasket.
- Pull the 2 dowels out of the engine casing.



- Loosen the bolts in a crosswise order to prevent the clutch discs from getting jammed when the clutch springs are released.
- Dismount the pressure cap together with bolts, spring retainer, and clutch springs.
- Remove the pressure piece ❶.
- Take all lining and steel discs out of the outer clutch hub.
- Remove all 12 driving pin sleeves ❷ (from model 2002 on).

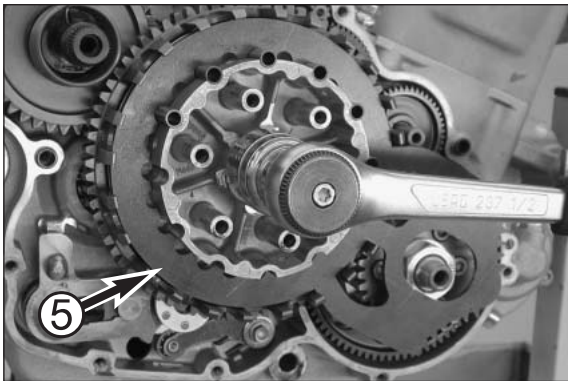


- Up to the 2002 model:
- Remove the circlip ❸.

From 2003 model:

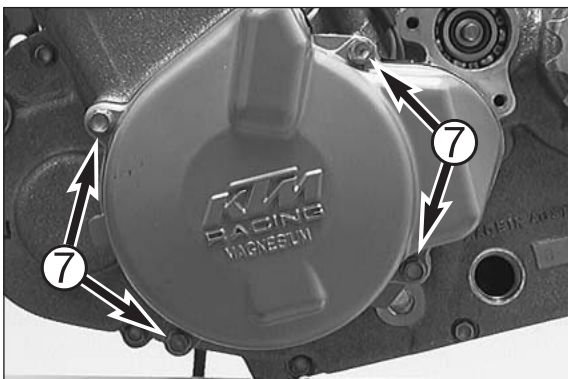
- Bend up the lock washer ❹ with a flat chisel, position the clutch holder 590.29.003.100 ❺ with 6 driving sleeves as shown and loosen the nut ❻.

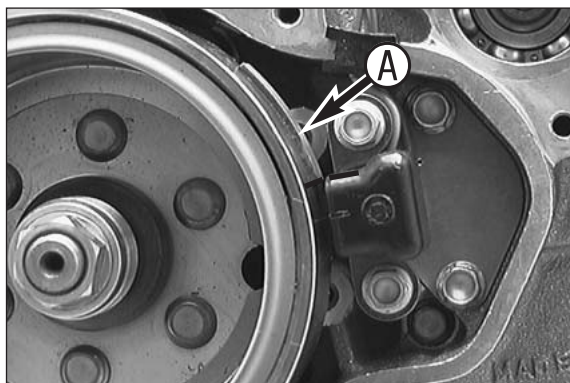
NOTE: Do not remove the clutch holder to allow the flywheel nut to be removed later.



Dismounting the ignition system (models 400/520 until 2002 only)

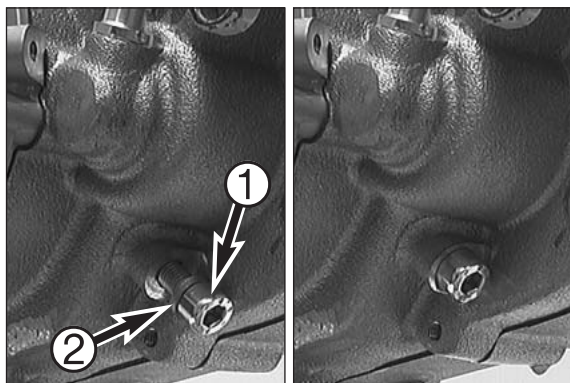
- Unfasten the 4 bolts ❷ and take the ignition cover together with the seal off the engine casing.



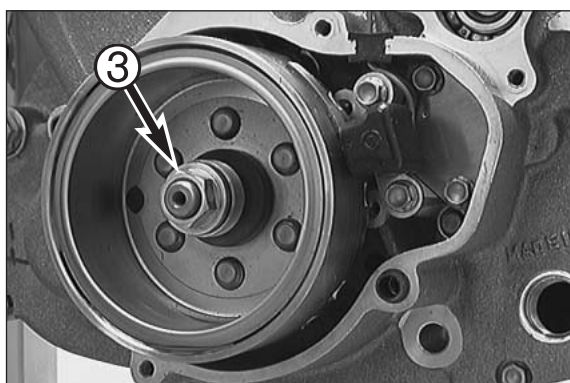


- Turn crankshaft to TDC.

NOTE: In the TDC position, the guidepiece **A** will be above the pulser coil (see photo).

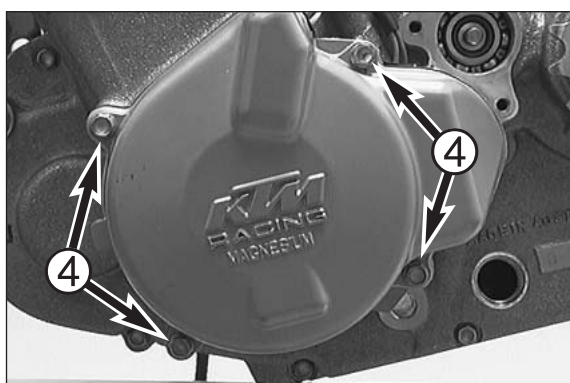


- Turn out the crankshaft fixing bolts **1** and remove the sealing ring **2**.
- Turn in the crankshaft fixing bolt by hand.
- If you feel any resistance, move the flywheel slightly back and forth so that the crankshaft fixing bolt may engage the recess of the crankshaft.
- Tighten the crankshaft fixing bolt to 10 Nm.



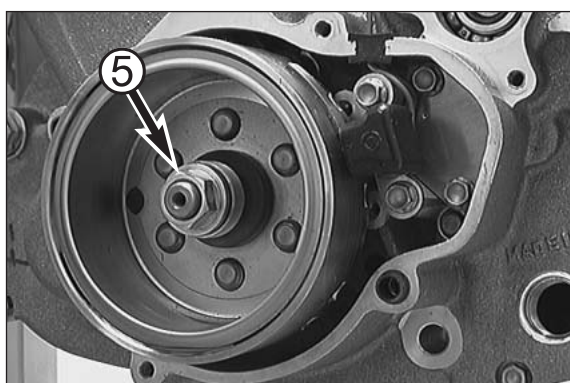
- Loosen the collar nut **3** and remove the spring washer.

NOTE: When ordering a new part, a forged rotor will be supplied, this part is produced without rivets and is interchangeable.



Dismounting the ignition system and loosening the primary gear (model 250 EXC from 2002, models 450/525 from 2003)

- Unfasten the 4 bolts **4** and take the ignition cover together with the seal off the engine casing.



- Holding the clutch holder mounted earlier, unscrew the nut **5**.
- Remove the clutch holder.

!

CAUTION

!

SINCE A LONGER CRANKSHAFT LOCATING SCREW IS MOUNTED ON THE 250 EXC MODELS, IT IS IMPERATIVE THAT YOU HOLD THE CLUTCH HOLDER WHILE UNSCREWING THE NUT **5**, OTHERWISE YOU MAY BEND THE LOCATING SCREW AND DAMAGE THE ENGINE HOUSING.



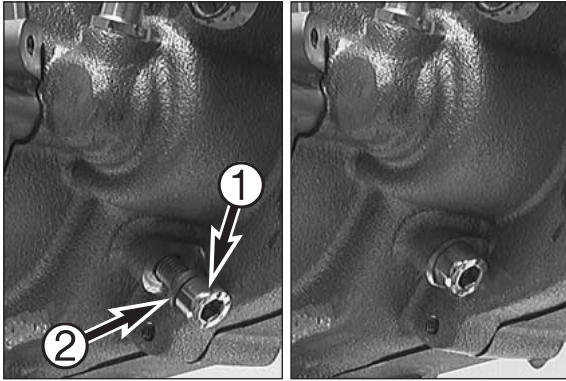
- Apply the special tool 590.29.003.100 as shown, loosen the collar nut from the primary gear and remove.
- Remove the special tool.

!

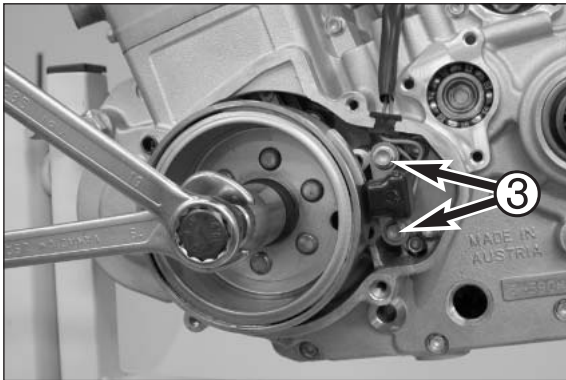
CAUTION

!

COLLAR NUTS WITH LEFT-HAND THREAD AND WITH RIGHT-HAND THREAD WERE USED RESPECTIVELY. COLLAR NUTS LABELED AS "LEFT" HAVE A LEFT-HAND THREAD. COLLAR NUTS WITHOUT LABELING HAVE A RIGHT-HAND THREAD.



- Turn the crankshaft to the TDC position (see illustration on page 4-4).
- Turn out the crankshaft fixing bolts ① and remove the sealing ring ②.
- Turn in the crankshaft fixing bolt by hand.
- If you feel any resistance, move the flywheel slightly back and forth so that the crankshaft fixing bolt may engage the recess of the crankshaft.
- Tighten the crankshaft fixing bolt to 10 Nm.



Pulling off the flywheel

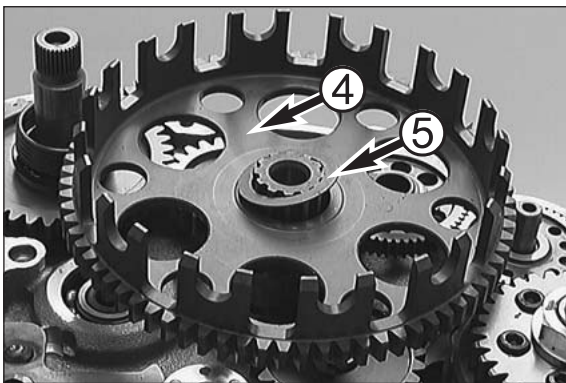
- Loosen the 2 bolts ③ and take the pulse generator out of the engine casing.
- Mount the puller tool 580.12.009.000 and pull off the flywheel. For the pull-off step, use the protection cover.
- Remove the Woodruff key from the crankshaft.

!

CAUTION

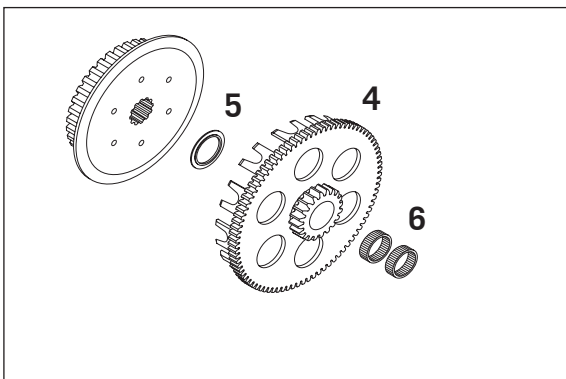
!

- NEVER USE A HAMMER OR OTHER TOOLS TO HIT AGAINST THE FLYWHEEL. THIS MIGHT CAUSE THE MAGNETS TO COME OFF THE FLYWHEEL AND THE CRANKSHAFT TO BE DAMAGED.
- HOLD THE PULLER TOOL TO PREVENT THE LOCATING SCREW FROM BEING BENT (250 EXC MODEL).

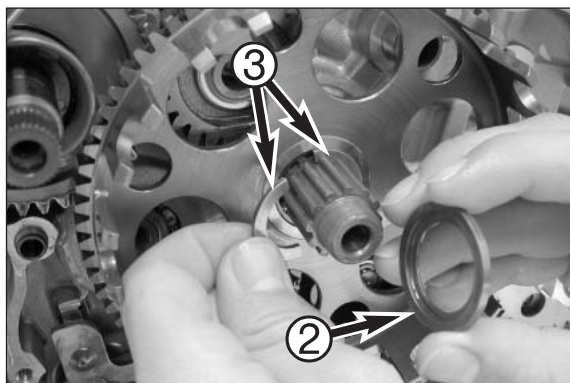


Removing the clutch drive and the outer clutch hub

- Insert the protection cover into the main shaft and mount the puller tool.
- Pull the inner clutch hub off the main shaft.
- Take the outer clutch hub ④ together with the bearing bush and the 2 stop discs off the main shaft.

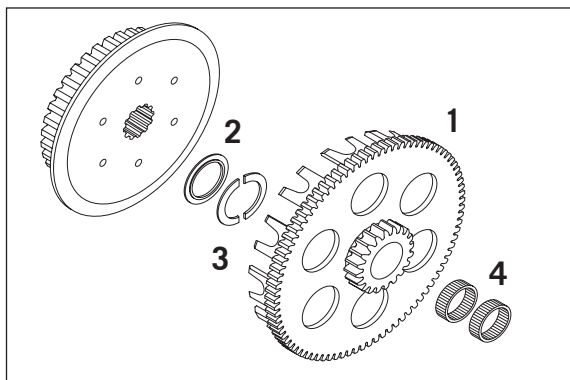


NOTE: In the 2001/2002 models, disk ⑤ is replaced by a stepped disk and the bushing by 2 needle bearings ⑥ (see illustration).

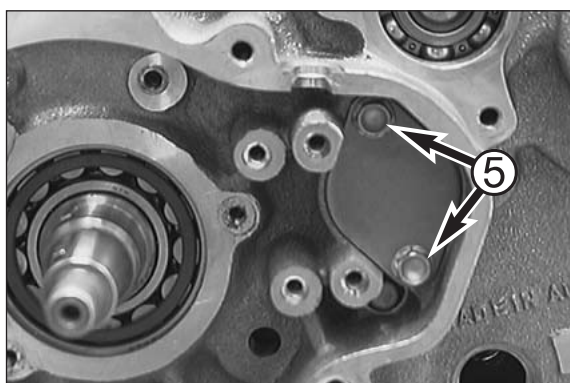


From the 2003 model:

- Remove the outer clutch hub ① together with the stepped disk ② and both half disks ③ from the main shaft.

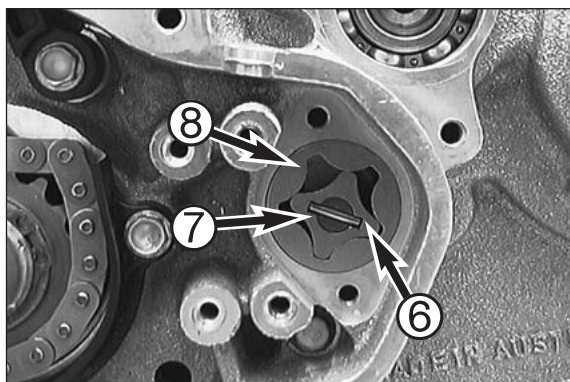


- Remove both needle bearings ④ and the supporting plate.

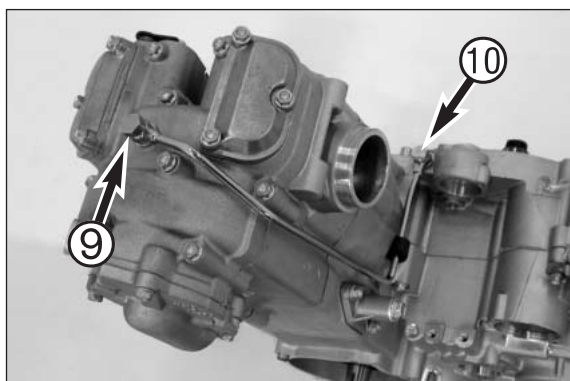


Dismounting the oil pump

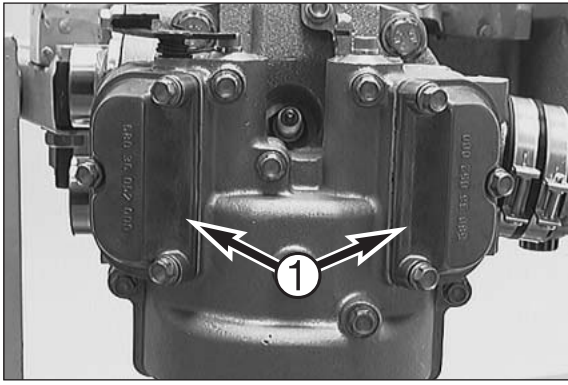
- Loosen the 2 bolts ⑤ and remove the oil pump cover.



- Pull needle roller ⑥, inner rotor ⑦ and outer rotor ⑧ out of the oil pump casing.

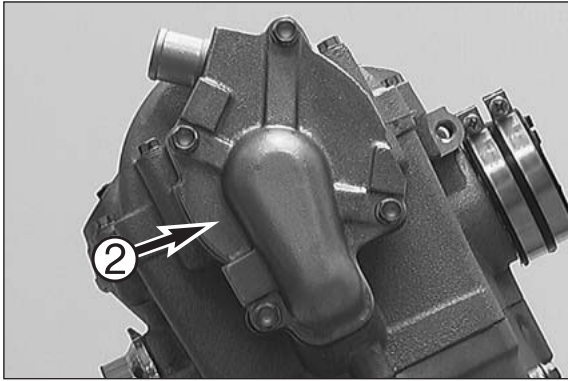


- Remove banjo bolt ⑨ and jet bolt ⑩ together with their sealing rings and dismount the oil line.

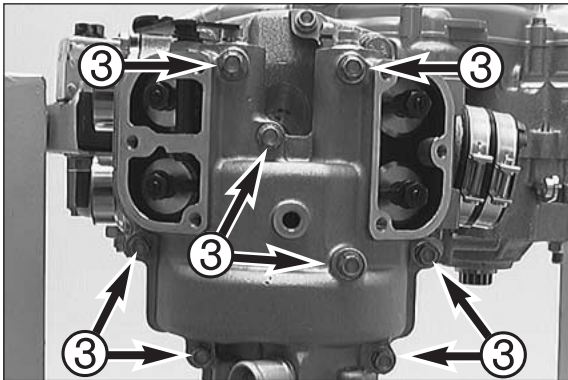


Dismounting the upper cylinder-head portion

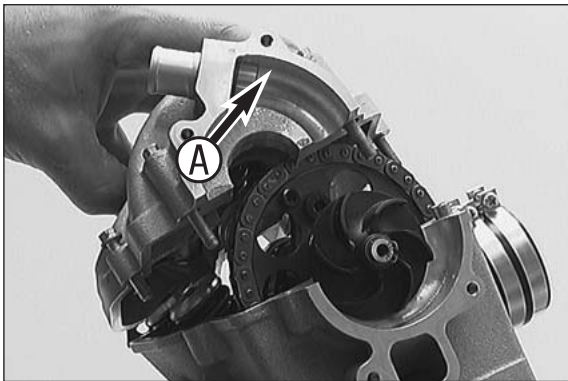
- Loosen each of the 6 bolts together with their sealing rings and dismount both valve covers **1** together with their gaskets.
- Unscrew the spark plug.



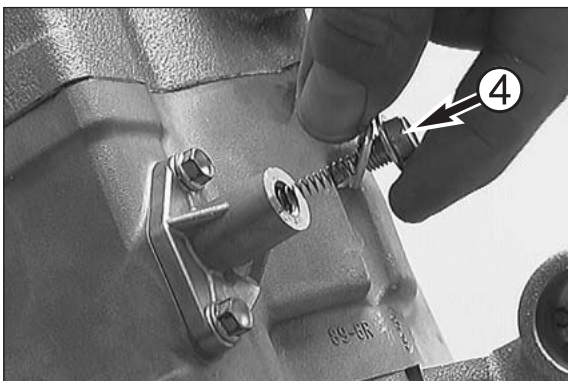
- Unfasten 4 bolts and dismount the water pump cover **2** together with its gasket.



- Loosen all bolts **3** of the upper cylinder head part.

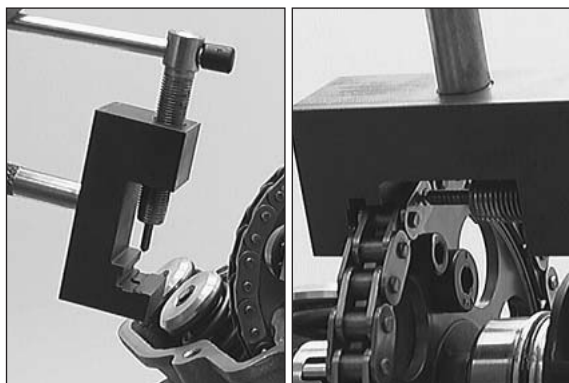


- Use a plastic hammer to carefully tap upwards in area **A** and lift off the upper cylinder head part.



Dismounting cylinder head, cylinder and piston

- Dismount the bolt **4** together with the sealing ring and the pressure spring.
- Unfasten the 2 bolts and pull the timing-chain tensioner out of the cylinder.



- Apply the timing chain separating tool 590.29.020.000 and open the timing chain by turning the spindle (see photo).

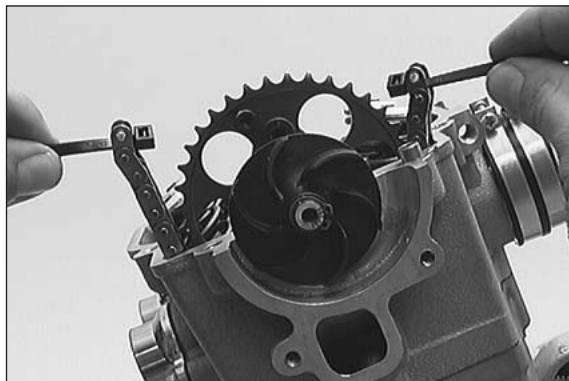
!

CAUTION

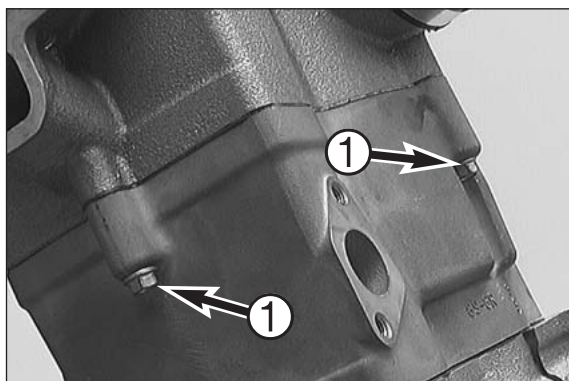
!

- MAKE SURE THAT THE PUSHED-OUT BOLTS DO NOT FALL INTO THE ENGINE.
- PREVENT THE TIMING CHAIN FROM FALLING INTO THE CHAIN TUNNEL.
- THE OPENED RIVET LINK IS TO BE DISCARDED.

NOTE: Every rivet link of the timing chain can be opened.



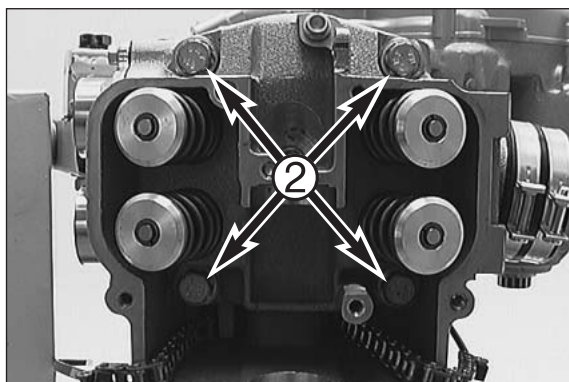
- To keep the timing chain from falling into the chain tunnel, you should insert a cable tie through the ends of the timing chain.
- Extract the camshaft from the cylinder head.



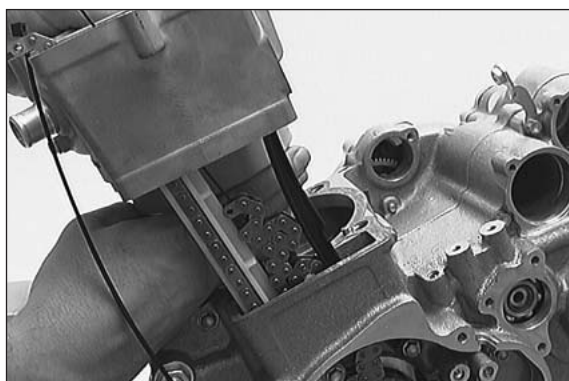
- Remove the 3 bolts ❶.

NOTE:

- If no repairs to the cylinder and cylinder head are necessary, these 3 bolts need not be removed. You can dismantle the cylinder and the cylinder head as one. In this case, the cylinder head gasket need not be replaced.
- from Model 2001 onwards the bolt outside the chain tunnel is mounted with a copper seal ring (6x10x1)



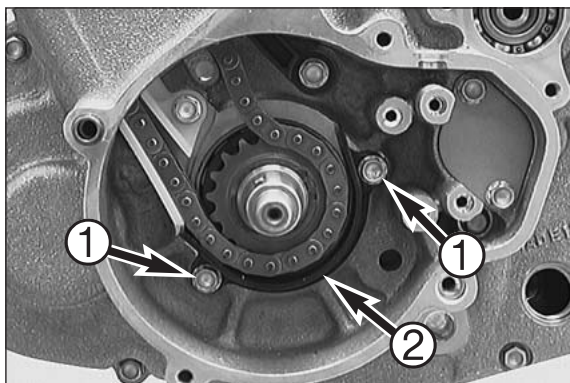
- Remove the 4 cylinder-head bolts ❷ together with washers and dismantle the cylinder head together with the cylinder head gasket.



- Pull the cylinder upward while holding the piston.

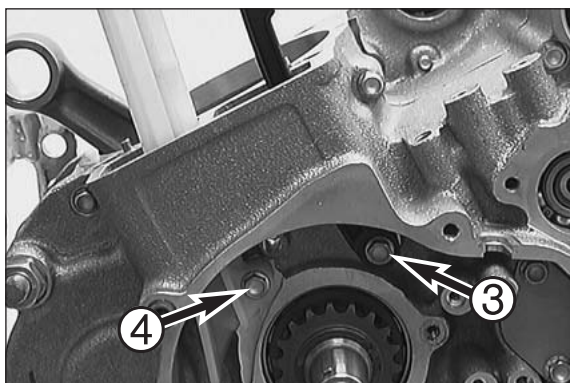


- Remove the wire circlip and the push piston bolt from the piston. Dismount the piston.

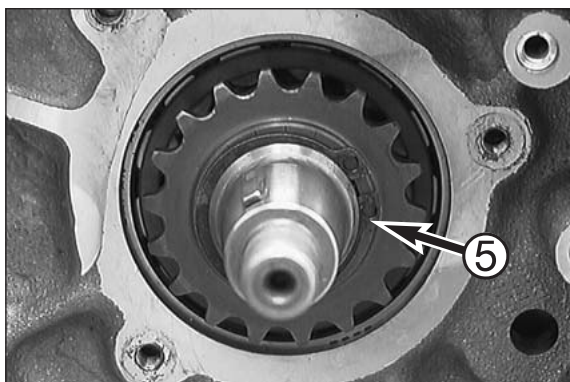


Dismounting timing chain and timing gear

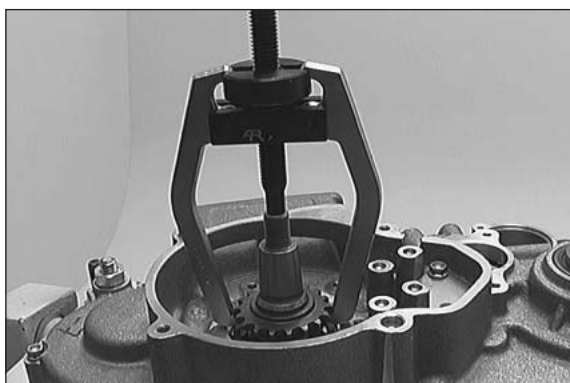
- Loosen the 2 bolts ① and dismount the fall-out protection element ②.
- Remove the timing chain.



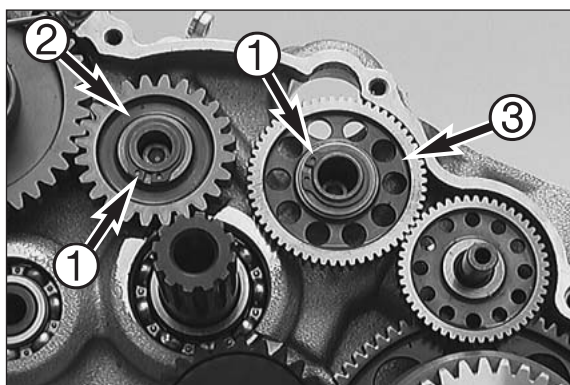
- Remove the bolts ③ and ④. Pull timing chain tensioner and timing chain guide upward out of the engine casing.



- Remove circlip ⑤.

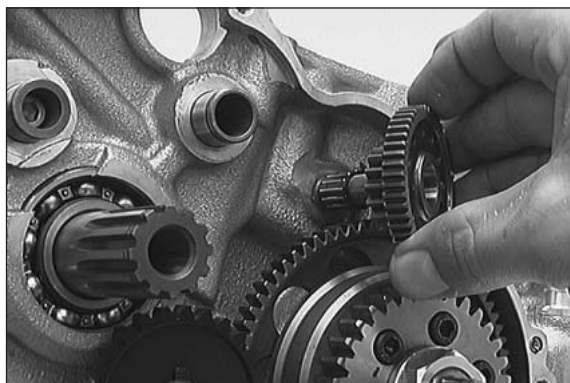


- Apply the puller tool 590.29.033.000 and pull the timing gear off the crankshaft.

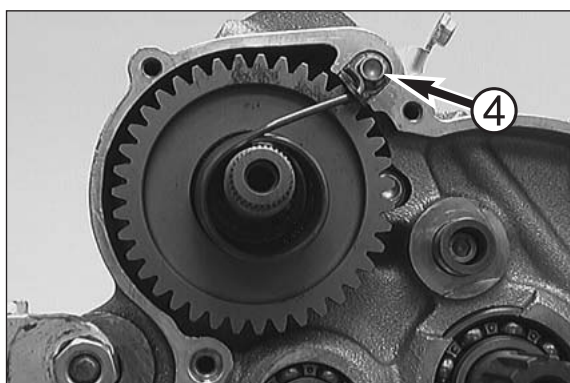


Dismounting E-starter drive gear and kickstarter

- Remove the 2 circlips **1** and the stop discs. Pull the kickstarter idler gear **2** and the E-starter idler gear **3** off the bearing bolts.



- Pull the reduction gear and the needle bearing off the bearing bolt. Take the bearing bolt out of the engine casing.



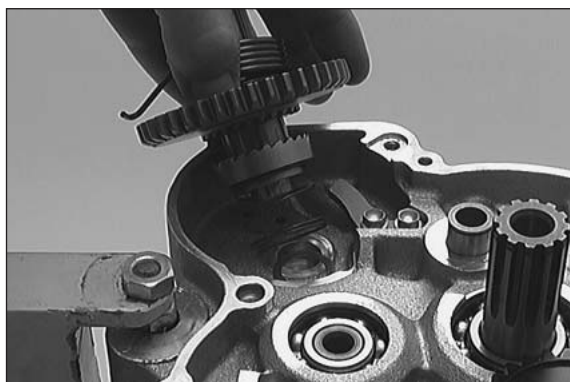
- Carefully loosen the collar bolt **4** while holding down the kickstarter spring. Release the kickstarter spring and unhitch the spring shackle.

!

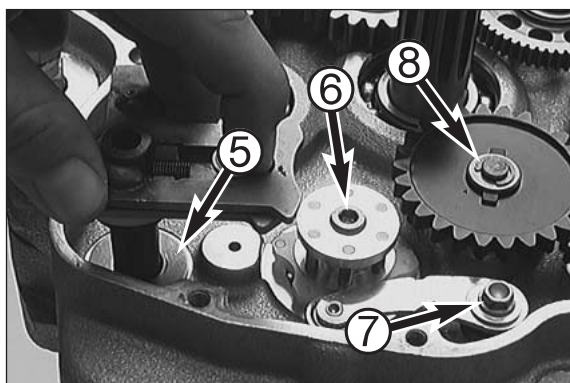
CAUTION

!

BE CAREFUL WHEN RELEASING THE KICKSTARTER SPRING, AS THE RECOILING KICKSTARTER SPRING MAY CAUSE INJURY.



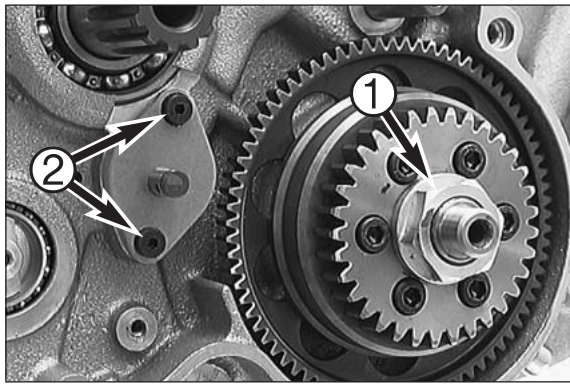
- Pull the kickstarter shaft together with ratchet gear, spring, and disc out of the engine casing.



- Slide back the sliding plate and pull the shift shaft together with the stop disc **5** out of the engine casing.
- Remove the bolt **6** and dismount the shift arrester.
- Remove the bolt **7**, dismount the arrester lever together with bushing and spring.

NOTE: The arrester lever only needs to be dismantled if the engine casing is exchanged.

- Remove the tab washer **8**. Pull stop disc, oil pump wheel, and needle roller off the oil pump shaft.



Dismounting primary gear and free wheel

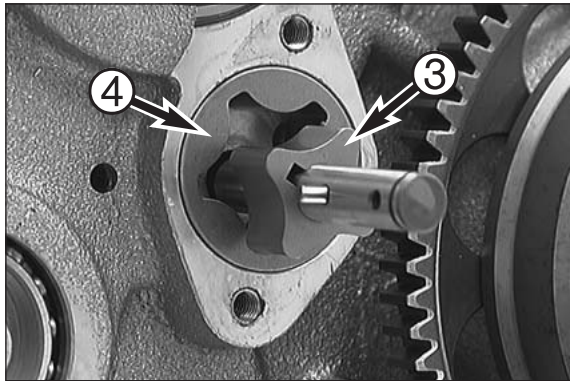
- Remove the collar nut ❶.

! CAUTION !

COLLAR NUTS WITH LEFT-HAND THREAD AND WITH RIGHT-HAND THREAD WERE USED RESPECTIVELY. COLLAR NUTS LABELED AS "LEFT" HAVE A LEFT-HAND THREAD. COLLAR NUTS WITHOUT LABELING HAVE A RIGHT-HAND THREAD.

NOTE: The collar nut ❶ was already removed from the 250 EXC models from 2002 and the 450/525 models from 2003 as described on page 4-5.

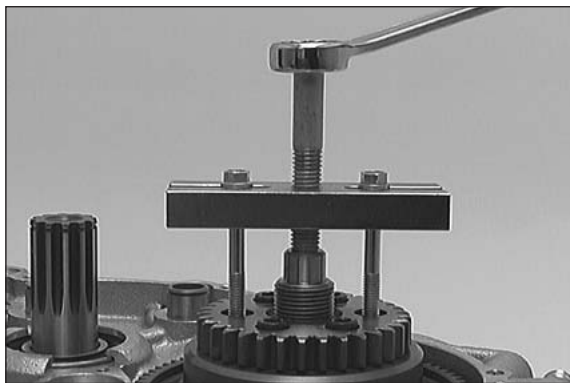
- Loosen the 2 bolts ❷ and dismount the oil pump cover.



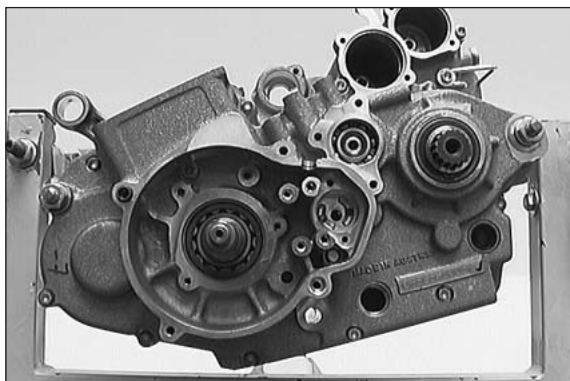
- Take the oil pump shaft together with needle roller, inner rotor ❸ and outer rotor ❹ out of the engine casing.



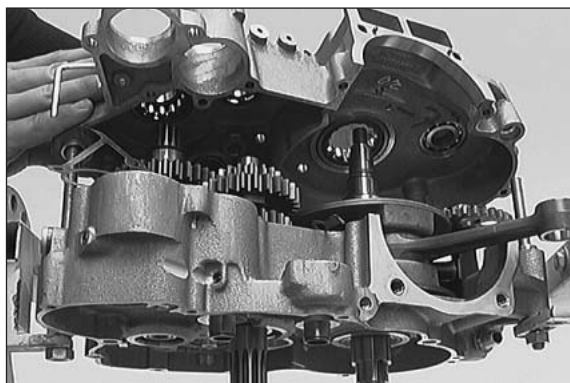
- Remove 2 bolts ❺ opposite located.



- Mount the puller tool 590.29.021.044 and pull the primary gear off the crankshaft.



- Loosen the crankshaft fixing bolt.
- Loosen each of the 13 casing bolts.



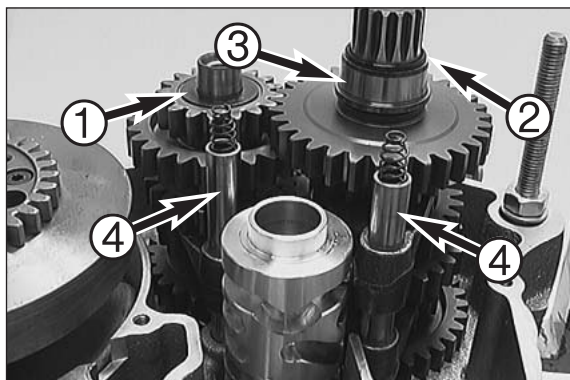
Dismounting shift mechanism and transmission

- Turn the engine sideward.
- Unfasten the engine fixture at the engine work stand
- Applying a suitable tool to the cast-on members on the casing, lift off the left half of the casing, or separate it from the right half by slightly tapping on the countershaft with a plastic hammer.

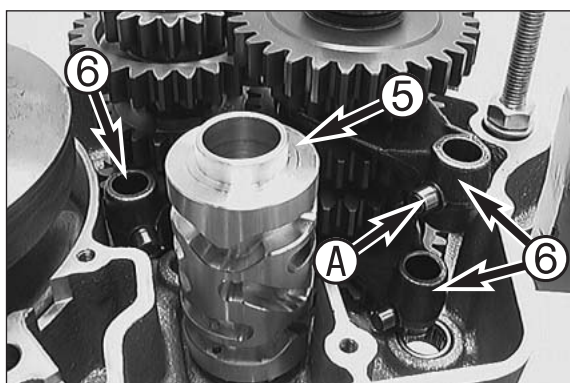
! CAUTION !

TRY TO AVOID PRYING THE HALVES APART WITH A SCREWDRIVER OR A SIMILAR TOOL AS THIS IS APT TO INFLICT DAMAGE ON THE SEALING SURFACES.

- Dismount the left casing half and the gasket.
- Pull the 2 dowels out of the engine casing and secure the right half of the casing in the work stand.

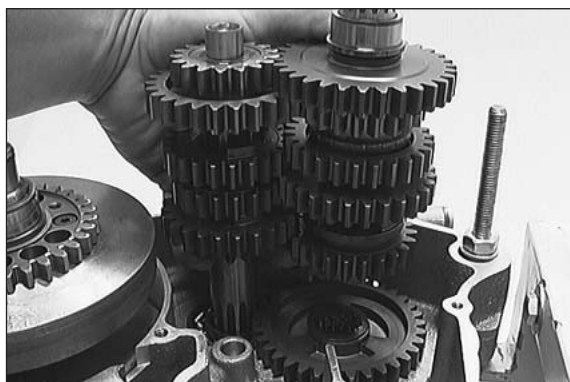


- Remove the stop disc ①, O-ring ②, and inner ring ③.
- Pull both shift rails ④ together with the 4 springs out of the engine casing and swing the shift forks sideward.

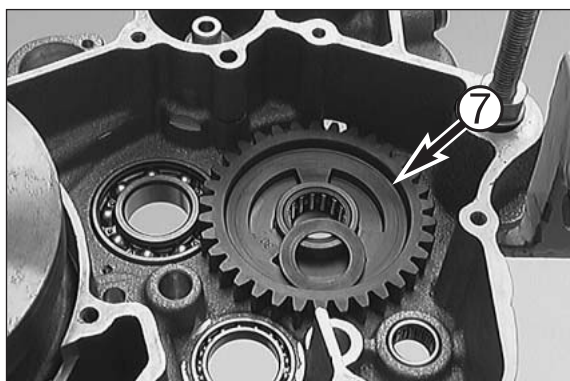


- Pull the shift roller ⑤ out of the bearing seat.
- Remove the shift forks ⑥.

NOTE: During disassembly, watch out for the shift rolls ① on the driving pins of the shift forks. They may remain in the shift roller.



- Pull main shaft and countershaft out of the bearing seats simultaneously.

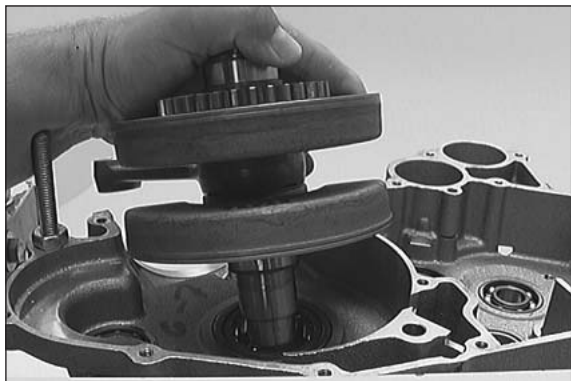


- Take 1st speed idler gear ⑦ together with needle cage and the two stop discs out of the engine casing.



Dismounting balancer shaft and crankshaft

- Turn the crankshaft until the marks on the balancer shaft and crankshaft match.
- In this position, the balancer shaft can be pulled out of the bearing seat.



- Pull the crankshaft out of the bearing seat.
- Clean all components, check them for wear and, if necessary, replace them with new ones.

NOTE: For a complete engine overhaul procedure, we recommend that you replace all gaskets, shaft seal rings, O-rings, and bearings.

SERVICING INDIVIDUAL COMPONENTS

5

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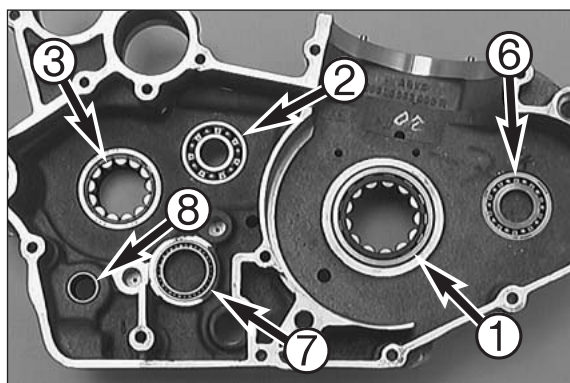
IMPORTANT NOTE REGARDS WORKING ON ENGINE HOUSING

Read through the following section before commencing work. Then determine the assembly sequence so that the engine housing halves only need to be heated up once before replacing the bearings.

Having first removed the dowels, in order to expel the bearings or remove them with light mallet blows, the housing halves must be placed on a suitably large plane surface, supporting the whole of the sealing surface without damaging it. A wooden panel is best used as a base.

Bearings or shaft seal rings should not be hammered into their seats. If no suitable press is available, use a suitable mandrel and hammer them in with great care. Cold bearings will practically drop into their seats at an engine housing temperature of approx. 150° C.

After cooling, should the bearings fail to lock in the bore, they are bound to rotate after warming. In that event the housing must be replaced.



Left casing half

Remove all shaft seal rings and use an oven to heat the casing half to approx. 150°C.

Cylindrical roller bearing of crankshaft ①

Use a suitable punch to press the cylindrical roller bearing from the outside to the inside. From the inside, press in a new cylindrical roller bearing up to the stop.

Grooved ball bearing of main shaft ②

Use a suitable punch to press the grooved ball bearing from the outside to the inside. From the inside, press in a new grooved ball bearing up to the stop.

Cylindrical roller bearing of countershaft ③

Use a suitable punch to press the cylindrical roller bearing from the outside to the inside. From the inside, press in a new cylindrical roller bearing up to the stop.

Shaft seal ring of shift shaft ④

From the outside, press in new shaft seal ring up to a flush position, its open side facing inward.

Shaft seal ring of countershaft ⑤

From the outside, press in new shaft seal ring up to a flush position, its open side facing inward.

Grooved ball bearing of balancer shaft ⑥

Use a bearing extractor to pull the grooved ball bearing out of the casing half. Press a new grooved ball bearing in up to the stop.

Grooved ball bearing of shift roller ⑦

At a casing temperature of approx. 150°C, the grooved ball bearing will fall out from the bearing seat almost by itself.

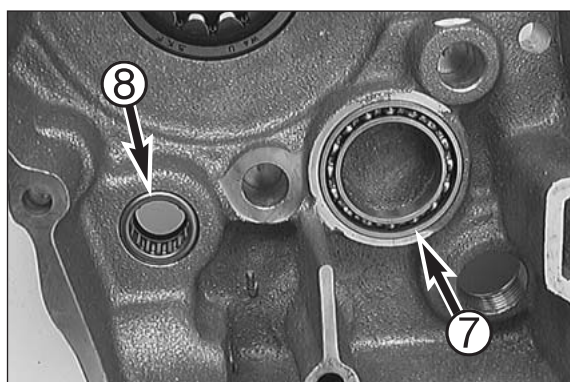
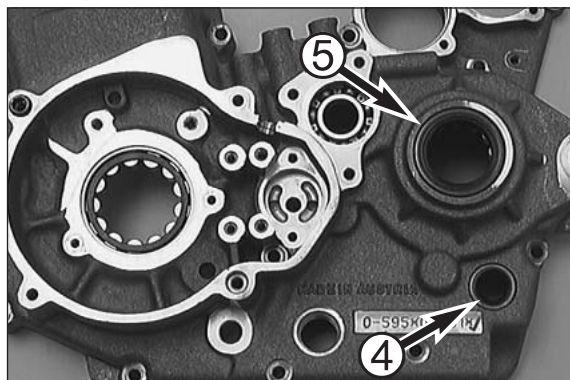
If necessary, knock the casing half lightly on a planar wooden board. Press a new grooved ball bearing in to a flush position.

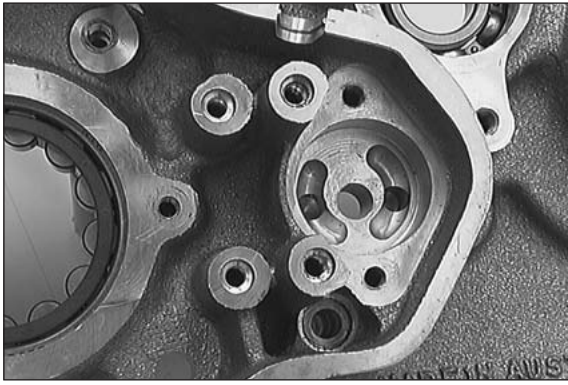
Needle bearing of shift shaft ⑧

Press needle bearing from the outside to the inside.

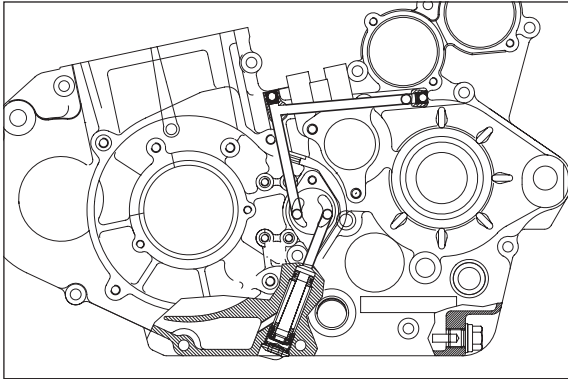
Press a new needle bearing in from the inside and up to a flush position.

– Once the casing half has cooled down, check the bearings for tight fit.

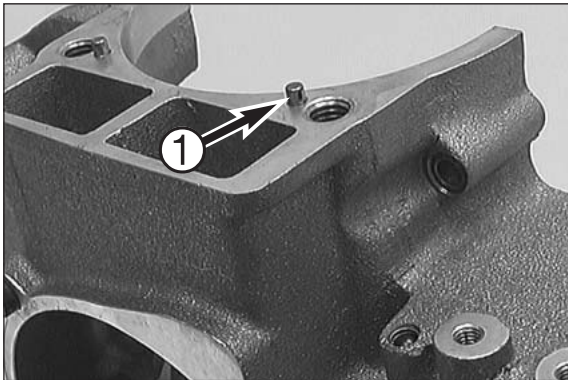




The oil pump housing must not have any score marks or seizing marks.



Blow compressed air through all oil ducts and check them for unobstructed passage.



Check the 2 dowels **1** for tight fit and, if necessary, adhere them by means of Loctite 243.

Right casing half

Remove all shaft seal rings and use an oven to heat the casing half to approx. 150°C.

Cylindrical-roller bearing of crankshaft **2**

Use a suitable punch to press the cylindrical-roller bearing from the outside to the inside. From the inside, press in a new cylindrical-roller bearing up to the stop.

Grooved ball bearing of main shaft **3**

Use a suitable punch to press the grooved ball bearing from the outside to the inside. From the inside, press in a new grooved ball bearing up to the stop.

NOTE: The grooved ball bearing on the main shaft **3** is secured with a screw from the 2003 models. Apply Loctite 243 to the thread of the screw and tighten to 5 Nm.

Grooved ball bearing of countershaft **4**

Use a suitable punch to press the grooved ball bearing from the outside to the inside. From the inside, press in a new grooved ball bearing up to the stop.

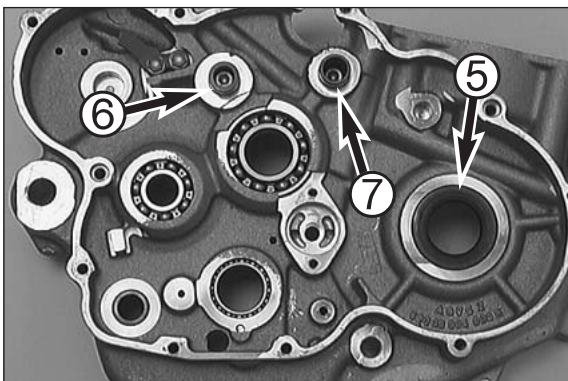
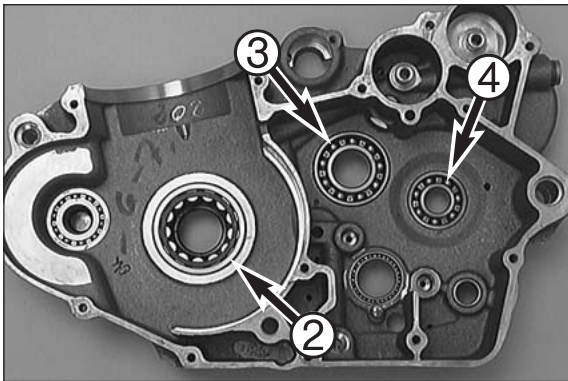
Shaft seal ring of crankshaft **5**

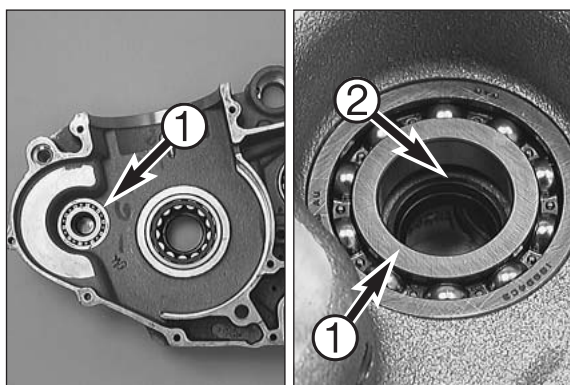
Press in new shaft seal ring to a flush position, its open side facing inward.

Bearing bolt of the kickstarter idler gear **6**

Bearing bolt of the E-starter idler gear **7**

By experience, no wear occurs on the bearing bolts. Exchanging of bearing bolts is possible only to a limited extent because, in most cases, this will cause damage to the casing.



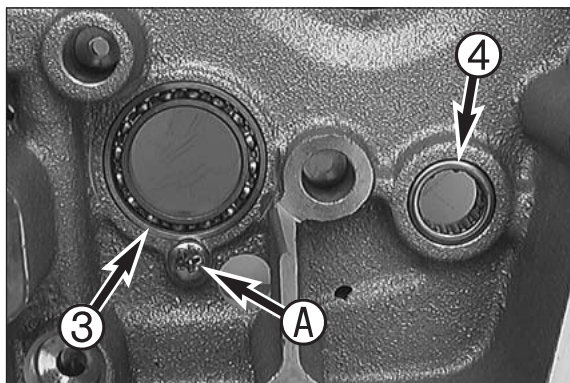


Grooved ball bearing **1** and seal ring **2** of balancer shaft.

Use a bearing extractor to pull the grooved ball bearing out of the casing half and remove the seal ring.

Press a new shaft seal ring in to a flush position, its open side facing downward.

Press new grooved ball bearing in up to the stop.



Grooved ball bearing of shift roller **3**

Remove the screw **A**.

At a casing temperature of approx. 150°C, the grooved ball bearing will fall out from the bearing seat almost by itself.

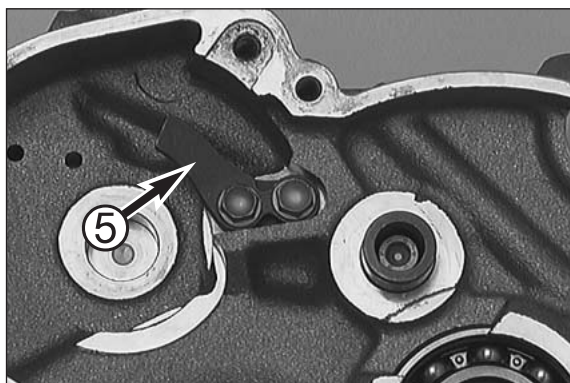
If necessary, knock the casing half lightly on a planar wooden board. Press new grooved ball bearing in to a flush position. Coat the thread of the screw **A** with Loctite 243 and tighten the screw to 6 Nm.

Needle bearing of shift shaft **4**

Press needle bearing from the outside to the inside.

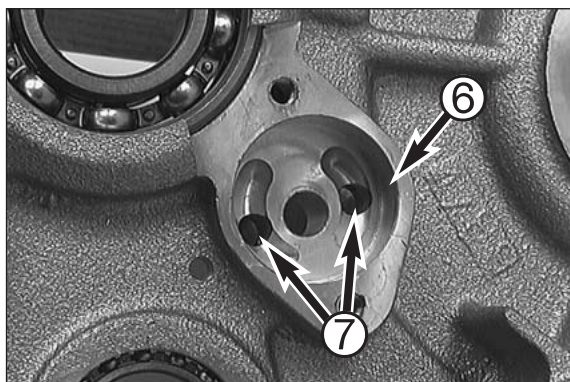
Press new needle bearing in from the outside and up to a flush position.

– Once the casing half has cooled down, check if the fit of the bearings is tight.



Kickstarter release plate **5**

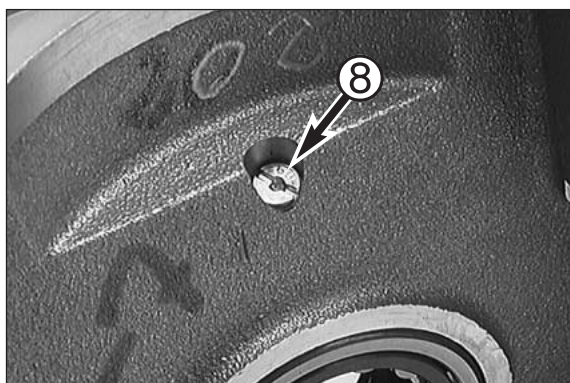
When exchanging the release plate, secure both bolts with Loctite 243 and tighten to 10 Nm.



The oil pump casing **6** must not have any score marks or seizing marks.

Check oil ducts **7** for unobstructed passage.

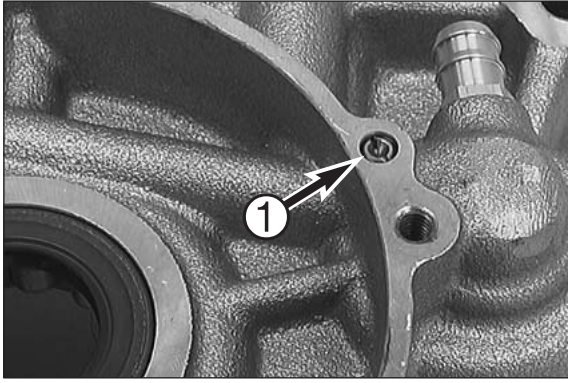
NOTE: In order to clean all oil ducts and check them for unhindered passage you should dismantle both jets and the bypass valve (see below).



Oil jet "60" **8**

Dismount the oil jet and blow compressed air through the oil duct. Degrease the thread of the oil jet, apply Loctite 243 and mount the oil jet.

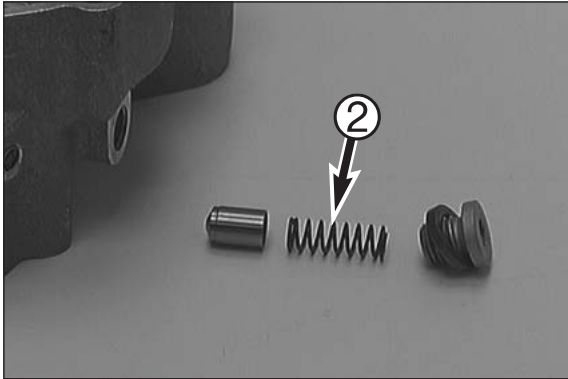
NOTE: Through this jet, engine oil is sprayed to the piston bottom in order to cool the piston.



Oil jet "100" ①

Dismount the oil jet and clean with compressed air. Degrease the thread of the oil jet, apply Loctite 243 and mount the oil jet.

NOTE: This jet is used to dose the amount of oil for the conrod bearing.

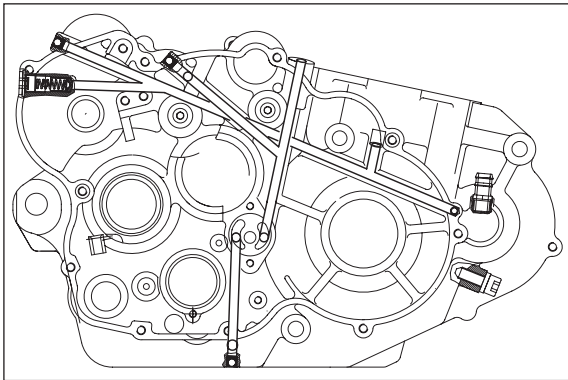


Bypass valve

Check valve plunger, sealing seat, and pressure spring for damage.

Minimum length of pressure spring ②: 23.5 mm

NOTE: If the length of the pressure spring is less than 23.5 mm, the opening pressure of the bypass valve will decrease. This causes a decrease in oil pressure and subsequently increased wear.



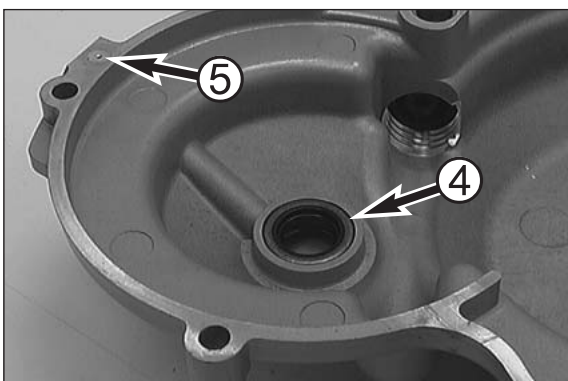
Clean all oil ducts with compressed air and check them for unobstructed passage.



Clutch cover

Shaft seal ring of kickstarter shaft ④

Remove the old shaft seal ring by levering it out with a screwdriver. Press a new shaft seal ring in up to the stop.

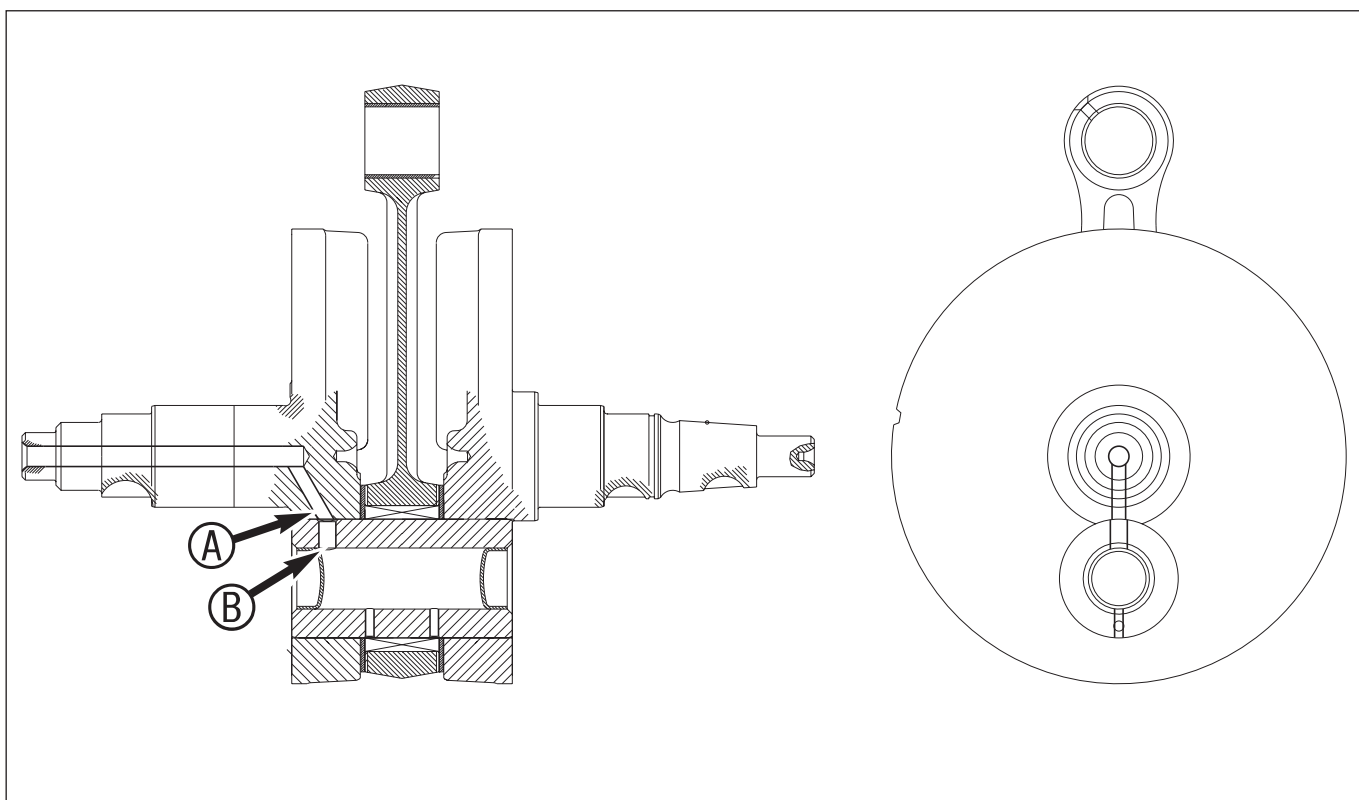


Shaft seal ring of crankshaft ④

Remove the old shaft seal ring by levering it out with a screwdriver. Press a new shaft seal ring in up to the stop, its open side facing downward.

Oil duct ⑤

Clean with compressed air and check for unobstructed passage.



Crankshaft

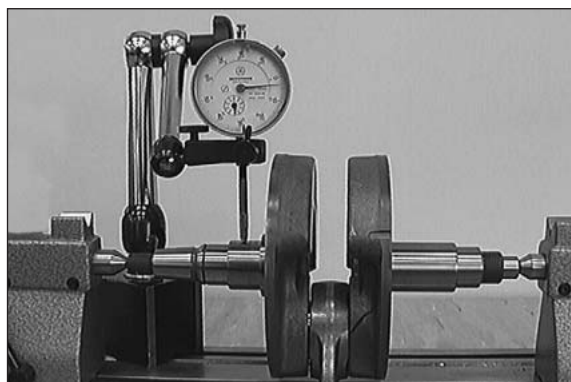
If the conrod bearing is replaced, take care to properly position the crankpin. The bores of the crank web **A** and crank pin **B** must coincide.

!

CAUTION

!

IF THE CRANK PIN IS PRESSED IN THE WRONG POSITION, THE CONROD BEARING IS SUPPLIED INSUFFICIENTLY OR NOT AT ALL WITH ENGINE OIL, WHICH RESULTS IN BEARING DAMAGE.



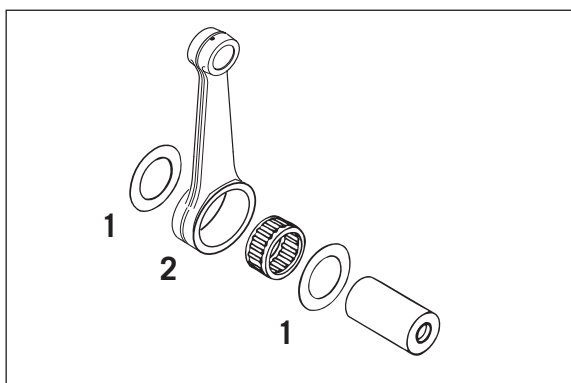
If the crankshaft will continue to be used, check crankshaft journals for run out. Place crankshaft on a roller block or a similar device and check the outer end of the journals for run out with a dial gauge.

Run out of crankshaft journals: max. 0,12 mm

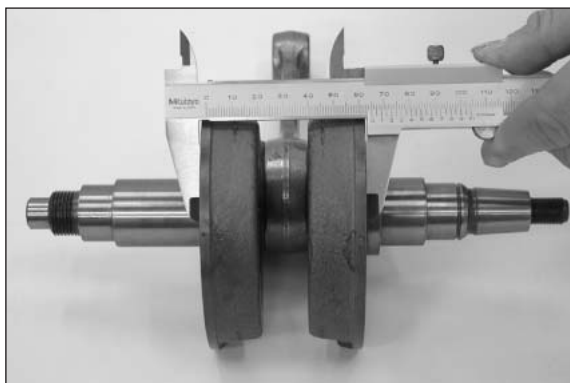
The radial play and axial play on the conrod bearing must be checked.

radial clearance: max. 0.05 mm

axial clearance: max. 1.10 mm



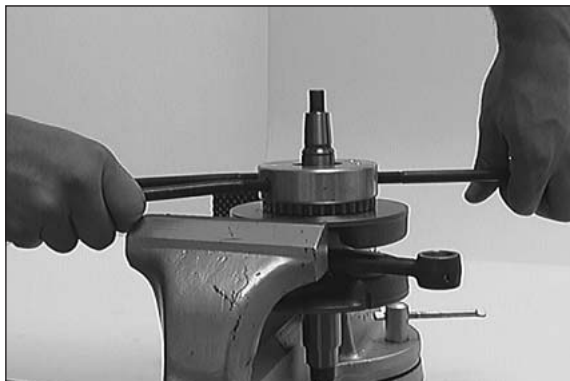
NOTE: From Model 2001 onwards the conrod **2** is mounted without thrust washers **1**, but the conrod overhaul set (see drawing below) is the same for both Model 2000 and 2001. The thrust washers included in the set are not used for Model 2001 engines.



Crankshaft webs – measure outer dimension

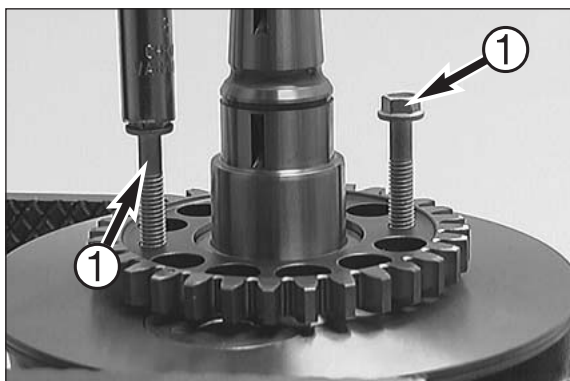
Crankshaft webs – measure outer dimension with a sliding caliper as illustrated.

Crankshaft webs – outer dimension = 65 mm ± 0.05 mm

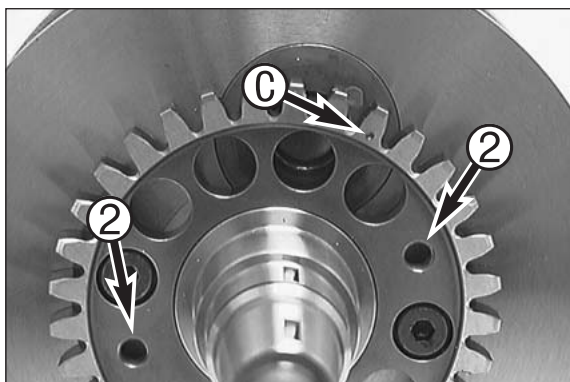


Driving gear of balancer shaft

- Before pulling the driving gear off the balancer shaft you have to remove the inner ring of the crankshaft bearing:
- For this purpose, secure the crankshaft with the crankshaft web carrying the inner ring to be replaced in a vise.
- Heat the special tool 584.29.037.037 on a heating pad up to approx. 150°C and slip it on the inner ring immediately. Press the special tool together tightly so as to obtain a good heat transfer and pull the inner ring off the crankshaft.



- Remove both screws on the drive wheel.
- Insert 2 screws ① in the M6 thread ②.
- Pull off the driving gear by turning in the bolts equally.
- To mount the drive gear, heat it to approx. 100°C.
- Degrease the 2 retaining bolts of the drive gear and coat the threads with Loctite 243.
- Slip the drive wheel on the crankshaft such that the mark ③ is disposed in the region of the crank pin.
- Mount the retaining bolts and tighten them to 8 Nm.
- To mount the new inner ring, heat the special tool again to approx. 150°C, engage the inner ring and slip it on the crankshaft journal immediately.
- Allow the inner ring to cool for about 30 seconds and hammer the inner ring in once more by means of a suitable tube so as to ensure its proper fit.
- Having exchanged the inner rings, measure the axial clearance of the crankshaft.



! CAUTION !

NEVER CLAMP THE CRANKSHAFT IN A VISE WITH A CRANKSHAFT JOURNAL AND TRY TO HAMMER THE INNER BEARING RING APART. THIS WOULD CAUSE THE CRANKSHAFT WEBS TO BE COMPRESSED, MAKING THE CRANKSHAFT UNSUITABLE FOR FURTHER USE.

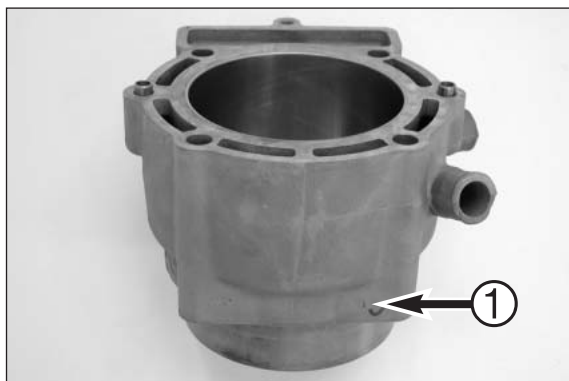
Compensating the axial clearance of the crankshaft

- Insert the crankshaft into the right casing half and apply the casing gasket.
- Mount and tighten the casing bolts in the region of the crankcase.
- Mount the dial gauge holder on the engine casing and measure the crankshaft's axial clearance.

Axial clearance: 0.25 - 0.35 mm

- If the value measured does not correspond to the desired value, correct the axial clearance.
- For this purpose, dismantle the crankshaft and use the special tool to pull the inner ring on the side of the ignition off the crankshaft. Now, add or remove compensating washers.

NOTE: If the axial clearance is too large, you have to add compensating washers. If axial clearance is too small, you have to remove compensating washers. These compensating washers may be added only on the ignition side.

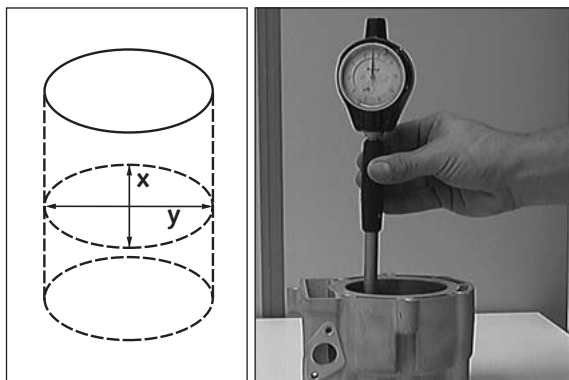


Cylinder – Nikasil coating

Nikasil is the brand name for a cylinder coating process, developed by the piston manufacturer Mahle. The name is derived from the two materials used in this process - a nickel layer into which the particularly hard silicon carbide is embedded. The main advantages of the Nikasil coating are excellent heat dissipation and thus better power output, low wear and low weight of the cylinder. The worn coating can be regenerated at low cost provided that the running surface of cylinder is flawless.

Measuring piston and cylinder, determining the piston fitting clearance

- In order to determine the wear of the cylinder, measure the cylinder center of the running area with a micrometer.
- Measure the diameter of the x-axis and the y-axis in order to check for oval wear, if any.



Cylinder diameter 250 EXC size I: 75.000 - 75.012 mm
size II: 75.013 - 75.025 mm

Cylinder diameter 400/450 EXC/MXC size I: 89.000 - 89.012 mm
size II: 89.013 - 89.025 mm

Cylinder diameter 450 SX/SMR/SXS, 520 SX/525
size I: 95.000 - 95.012 mm
size II: 95.013 - 95.025 mm

Cylinder diameter 540 SXS/610 CRATE 100.000 - 100.012 mm

NOTE: The size of the cylinder ❶ is marked on the cylinder, the size of the piston is marked at the top of the piston ❷.

- The piston is measured on the piston skirt across to the piston pin as shown in the illustration.

Diameter of piston 250 size I: 74.950 - 74.980 mm
size II: 74.961 - 74.990 mm

Diameter of piston 400 size I: 88.920 - 88.950 mm
size II: 88.931 - 88.960 mm

Diameter of piston 450 EXC/MXC size I: 88.916 - 88.946 mm
size II: 88.926 - 88.956 mm

Diameter of piston 520 size I: 94.942 - 94.950 mm
size II: 94.951 - 94.958 mm

Diameter of piston 450 SX/SMR/SXS size I: 94.932 - 94.960 mm
size II: 94.940 - 94.968 mm

Diameter of piston 525 size I: 94.922 - 94.950 mm
size II: 94.951 - 94.978 mm

Diameter of piston 540 SXS/610 CRATE size I: 99.940 - 99.948 mm
size II: 99.950 - 99.958 mm

- The cylinder diameter minus the piston diameter yields the piston assembly clearance.

Piston assembly clearance 250 size I: 0,030 - 0,052 mm
size II: 0,032 - 0,055 mm
wear limit: 0,12 mm

Piston assembly clearance 400 size I: 0,060 - 0,082 mm
size II: 0,062 - 0,085 mm
wear limit: 0,12 mm

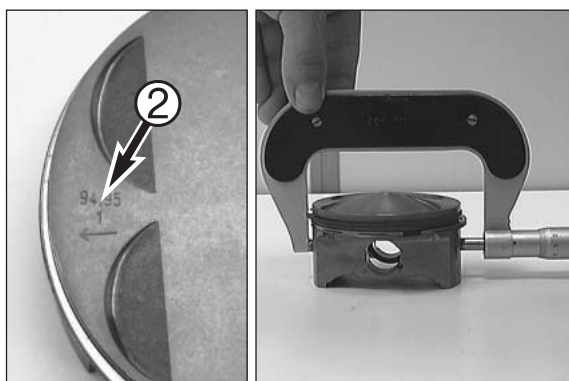
Piston assembly clearance 450 EXC/MXC size I: 0,054 - 0,096 mm
size II: 0,056 - 0,099 mm
wear limit: 0,12 mm

Piston assembly clearance 520 size I : 0,050 - 0,070 mm
size II : 0,054 - 0,075 mm
wear limit: 0,12 mm

Piston assembly clearance 450 SX/SMR/SXS Größe I : 0,040 - 0,080 mm
size II : 0,044 - 0,085 mm
wear limit: 0,12 mm

Piston assembly clearance 525 size I : 0,050 - 0,090 mm
size II : 0,034 - 0,075 mm
wear limit: 0,12 mm

Piston assembly clearance 540/610 0,060 - 0,090 mm
wear limit: 0,10 mm





Checking the piston

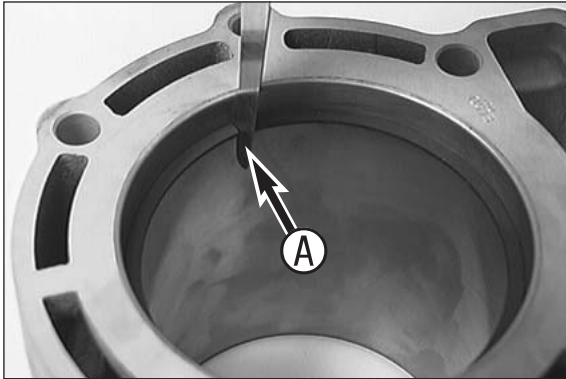
- Replace the piston in the case of excessive oil consumption or grooves in the piston skirt.
- If reinstalling the old piston perform the following steps:
 1. Piston bearing surface - check for damage.
 2. Piston ring grooves - the piston rings must move easily in the groove. Old piston rings or sandpaper (400 grit) may be used to clean the piston ring grooves.
 3. Piston rings - check for damage and end gap (see below). Mount the oil scraper ring with the labeling "TOP" facing upwards. Mount the rectangular ring with the labeling "O" facing upwards.
 4. Piston pin: If the piston pin is heavily discolored or has score marks it must be replaced. Also insert the piston pin into conrod and check its bearing for play.

Piston ring end gap

- Insert piston ring into the cylinder and adjust. Piston ring must be approx. 10 mm from top of cylinder.
- The end gap can now be checked with a feeler gauge **A**.

Compression rings: max. 0.80 mm
Oil scraper ring: max. 1.00 mm

If the end gap is larger, check piston and cylinder for wear. If piston and cylinder wear are within the permitted tolerance limits, replace the piston ring.

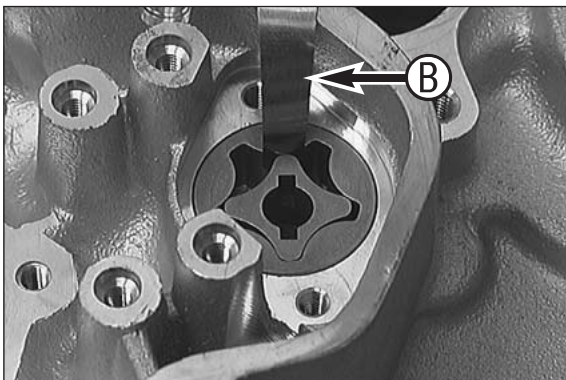
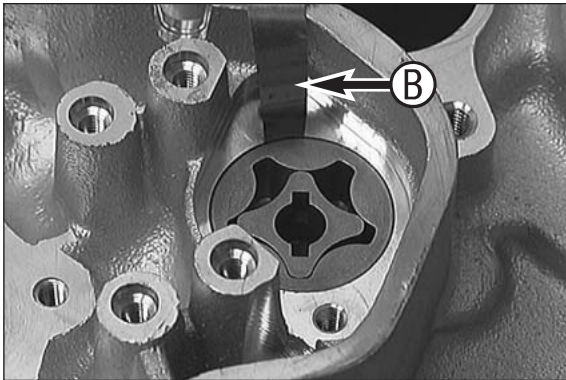


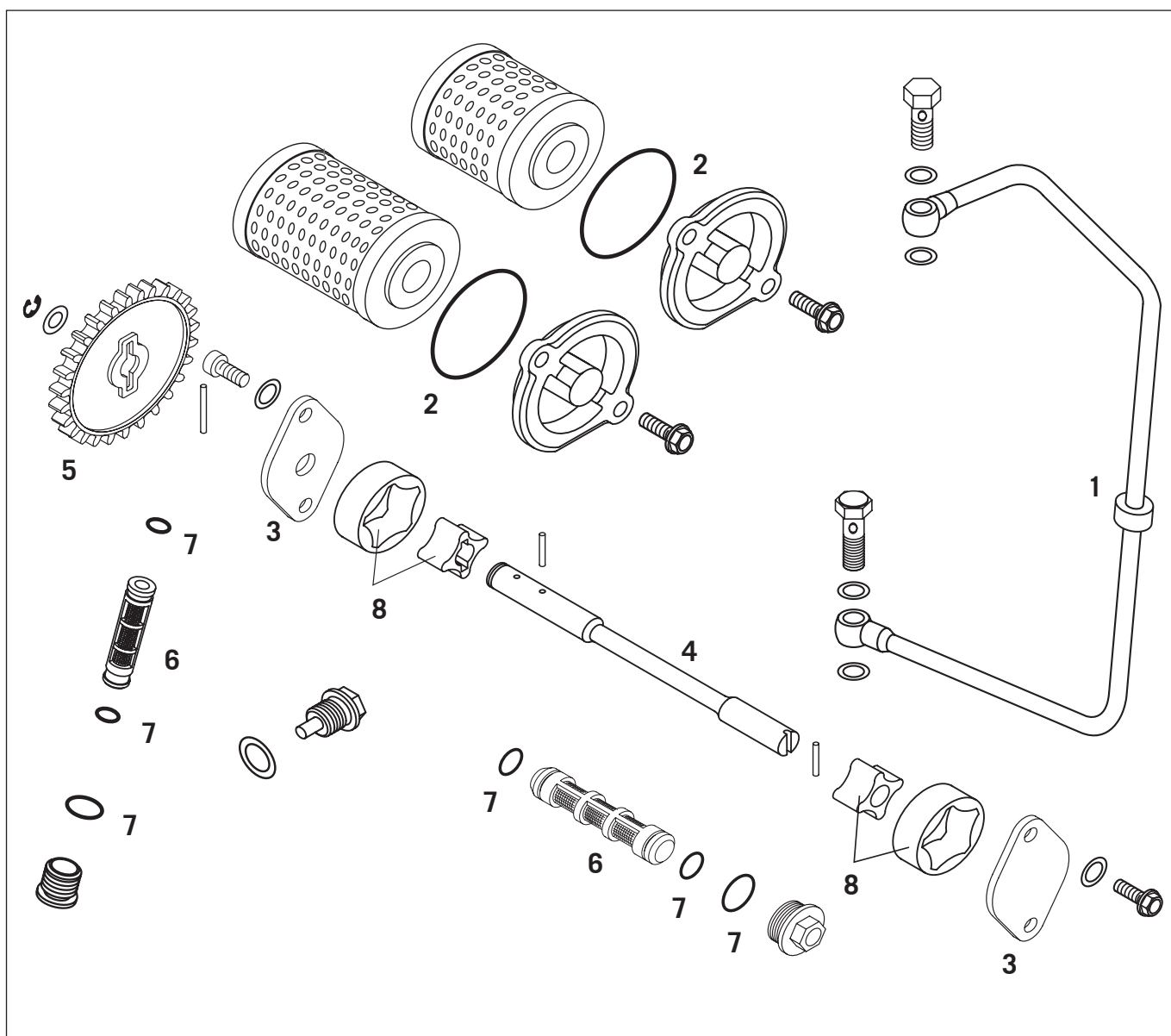
Checking the oil pumps for wear

- Place inner and outer rotors into the engine casing such that the marks are adjacent to one another.
- Now, carry out the following wear measurements with a feeler gauge **B**:

outer rotor - oil pump housing: max. 0.20 mm

outer rotor - inner rotor: max. 0.20 mm





Lubrication system

Oil line ①

Check for hairline cracking at the soldering joints, blow compressed air through the oil line and, while doing that, check it for unobstructed passage. In addition, check the oil line for possible scuff marks and replace the copper seal rings (8x12x1)

O-rings ②

Replace the O-rings during every oil filter change.

Oil pump cover ③

Check for score marks caused by the oil pump rotors on its inner side and, if necessary, replace it.

Oil pump shaft ④

Place it on a planar surface and check it for eccentricity.

Oil pump wheel ⑤

Check toothing for wear. The recess for the needle roller must not be worn out.

Oil screen ⑥

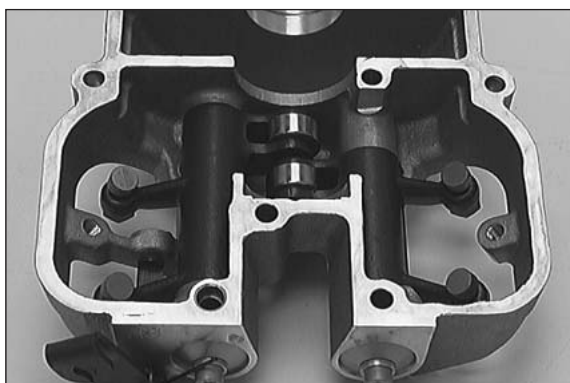
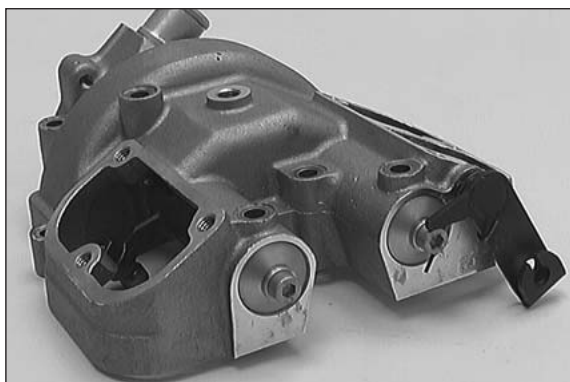
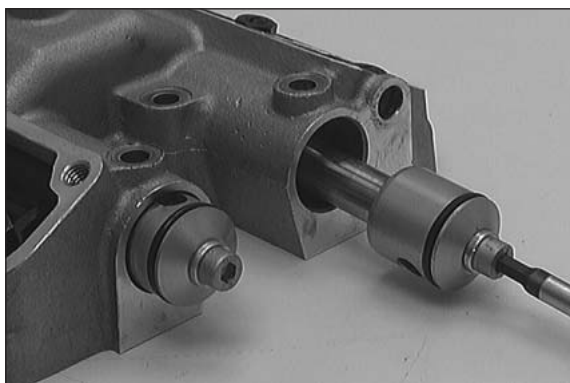
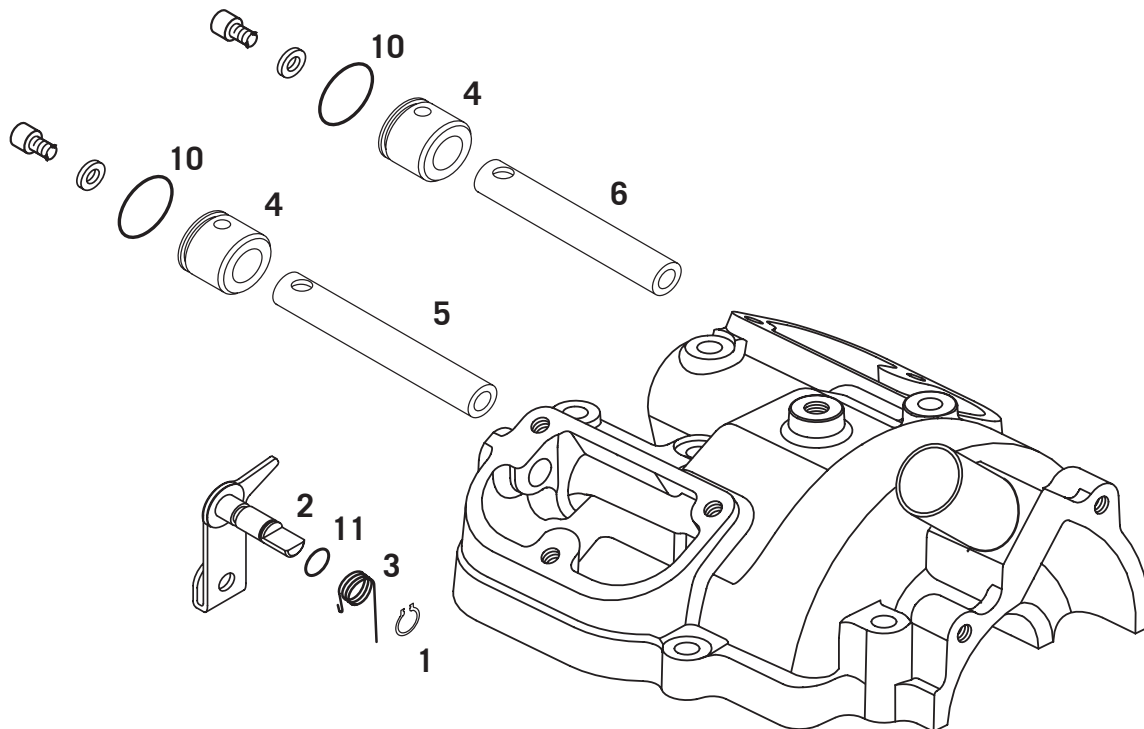
Clean the two oil screens with compressed air and petroleum.

O-rings ⑦

Check them for brittleness and, if necessary, replace them.

Oil pump rotors ⑧

Place the oil pump rotors into the engine casing and check them as shown on page 5-9. No particles must adhere to the oil pump rotors.



Upper portion of cylinder head

- Remove circlip **1** and pull the decompressor shaft **2** together with spring **3** out of the bore.
- Pull the two end pieces **4** together with the rocker arm pins **5** + **6** out of the cylinder head's upper portion. Withdraw the rocker arms **7**.
- Clean all components and check them for wear.

Rocker arm pins **5** + **6**

The rocker arm pins must not have any score marks and turning them in the rocker arms **7** must be easy.

Rocker arm rollers **8**

Check if they move smoothly; if you detect any radial play, you have to replace the rocker arm.

Adjusting bolts **9**

The seating surfaces of the adjusting bolts must be planar.

Decompressor shaft **2**

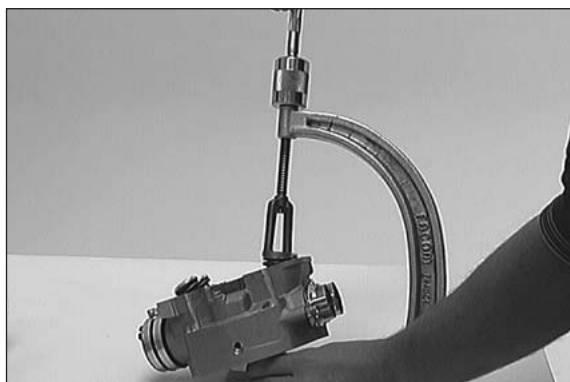
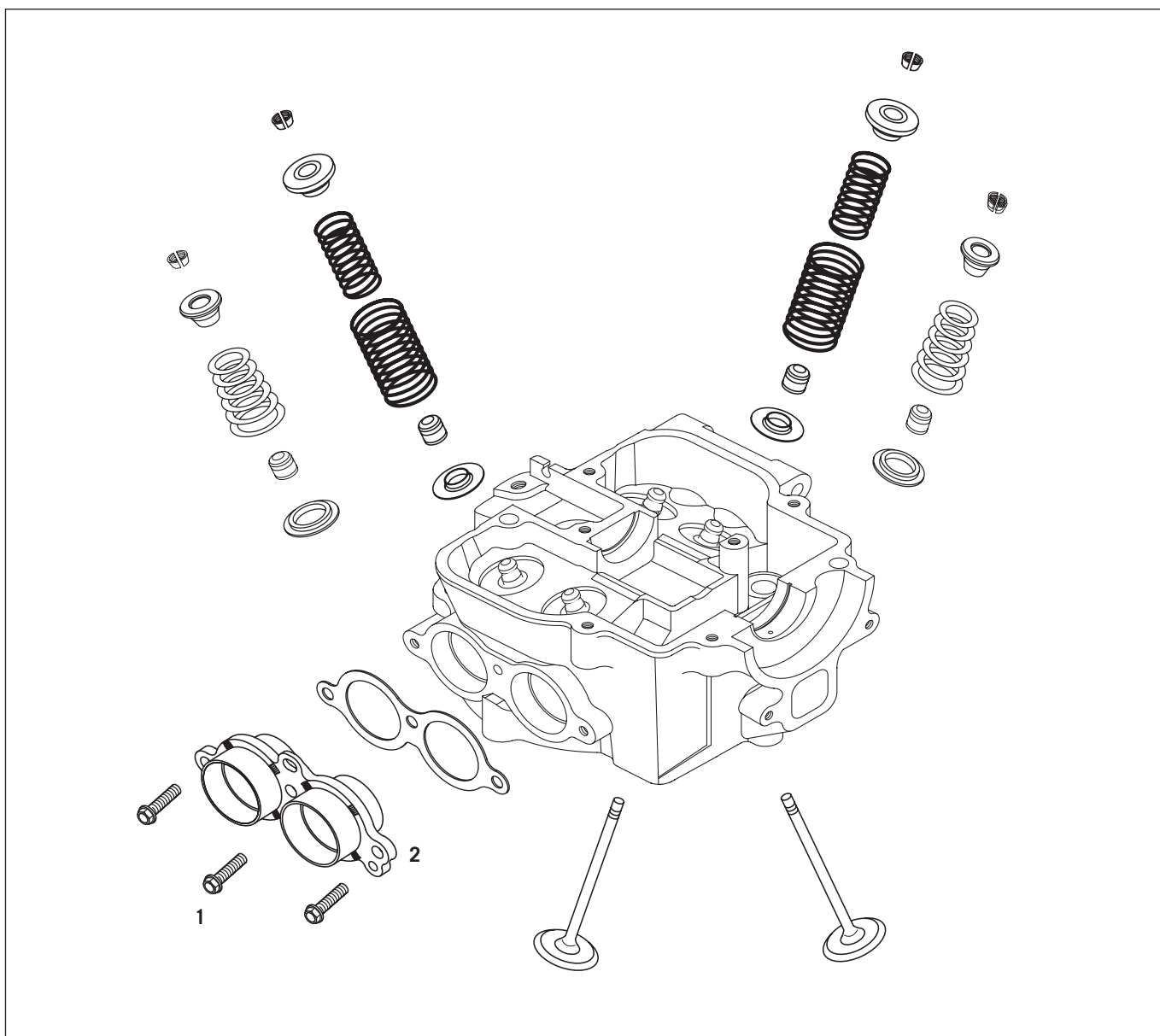
Check for smooth movability and play in the bearing bore. Replace the O-ring **11**.

Replace the O-rings **10**

- Prior to assembly, oil all components thoroughly.
- Position rocker arms in the cylinder head's upper portion and mount the rocker arm pins.

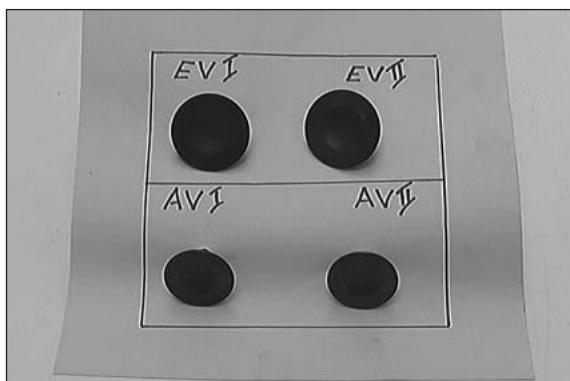
NOTE: The shorter rocker arm pin **6** must be mounted in the back.

- Mount the end pieces **4** and turn them such that later on the bolts of the cylinder head's upper portion can be mounted.
- Mount the decompressor shaft **2** and preload the spring.



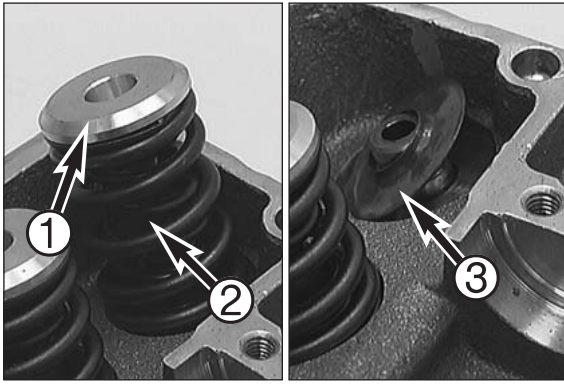
Cylinder head

- Loosen the 3 bolts **1** and dismount the exhaust flange **2** together with its gasket.



- Dismount the 4 valves with the aid of a special tool 590.29.019.000.

NOTE: When being mounted again, used valves must be mounted in the same valve guide as before. For this purpose, place the valves in a cardboard box in the same position they were mounted in the cylinder head (see photo).



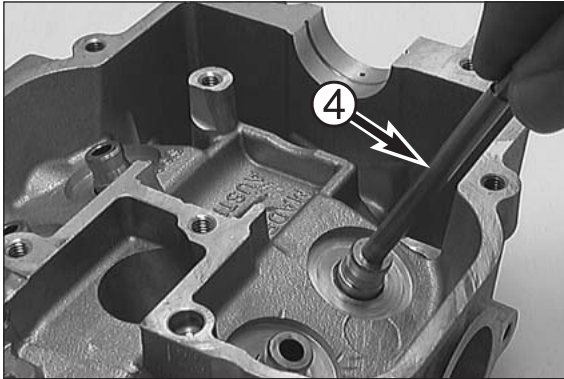
- Take the valve spring retainer ① and the valve springs ② out of the cylinder head.
- Pull the valve stem gaskets off the valve guides and remove the spring seats ③.

Sealing surface

Check the spark plug thread and the valve seats for damage and cracks. Use a ruler and a feeler gauge to check the sealing surface of the cylinder head for distortion. Max. distortion: 0.10 mm.

Valve guides

The valve guides are checked with a limit plug gauge 590.29.026.006 ④ (Ø 6.05 mm). If the limit plug gauge can be easily inserted into the valve guide, the guide must be replaced in a specialized workshop.



Valve seats

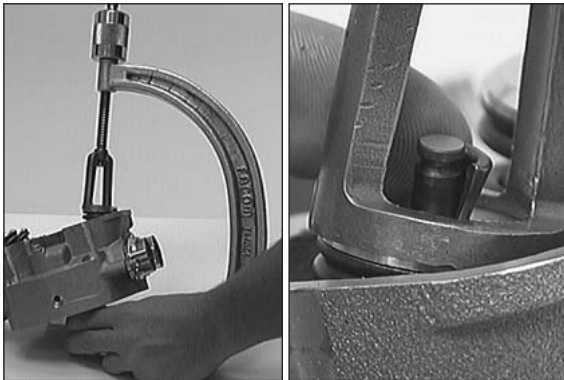
The valve seats must not be "battered". Sealing seat width: inlet: 1.50 mm max.; outlet: 2.00 mm max. If necessary, the valves must be reseated.

Valves

Check the valve disc for wear and eccentricity. Max. eccentricity at valve disc: 0.03mm. The valve seat must not be "battered". The sealing surface should be in the middle of the valve seat. The valve stem is chrome-hardened; by experience, wear occurs at the valve guide.

Valve springs

Check the valve springs for fractures or wear (visual check); use a sliding caliper to measure the length. Replace the spring if it is shorter see Technical Data – also see Technical Information 0003/30/02.

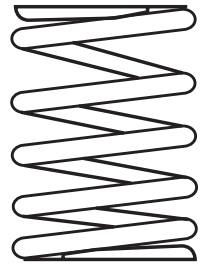


Valve stem gaskets

Every time the valves are dismantled you should replace the valve stem gaskets.

- Place the 4 spring seats ③ into the cylinder head.
- Slip the valve stem gaskets onto the valve guides and oil them.
- Thoroughly oil the valves at the stem and insert them into the valve guides. When mounting them, watch for the correct position of the valves.
- Position the valve springs ②, place the valve spring retainer ① into the valve springs.

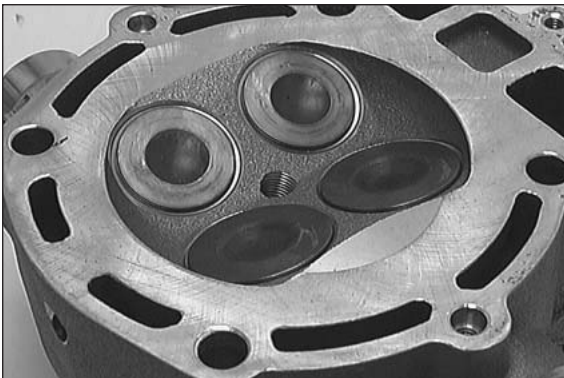
NOTE: The outer valve springs must be mounted with the more narrowly wound end facing downward (up to model 2001).

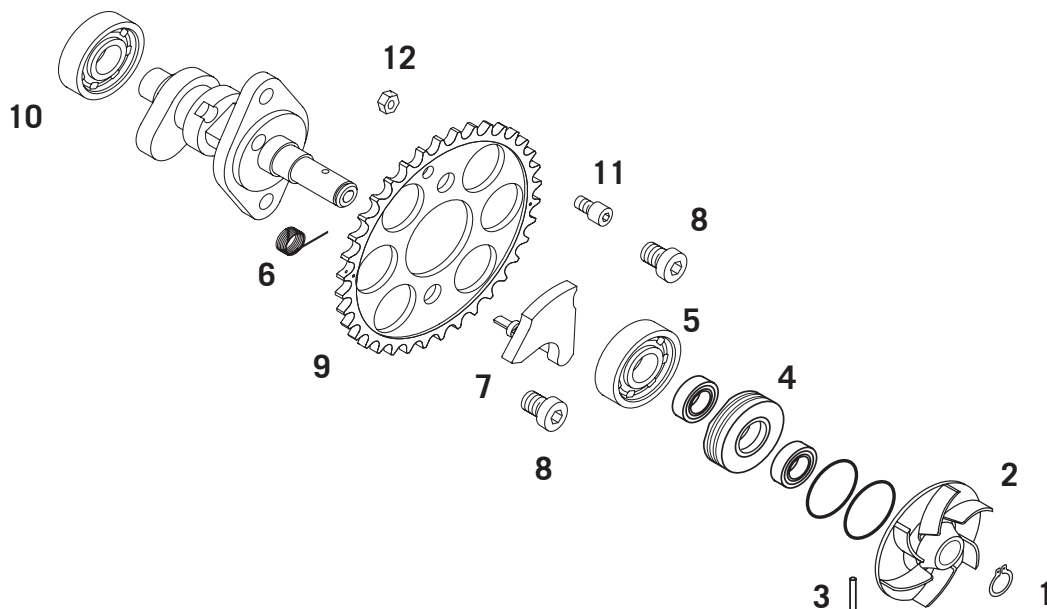


- Preload the valve springs with the special tool and mount the valve keys.

NOTE: When mounting the valve keys ensure their proper fit. It is best to secure the valve keys to the valve by means of some grease.

- Finally, use a plastic hammer to tap several times onto the valve spring retainers.





Camshaft

- Dismount circlip **1** and water pump wheel **2**.
- Pull the needle roller **3** out of the hole in the camshaft and pull the gasket carrier **4** off of the camshaft.



- Use the puller tool 590.29.033.000 to extract the grooved ball bearing **5** from the camshaft (see photo).

! CAUTION !

NEVER CLAMP THE CAMS OF THE CAMSHAFT INTO A VISE.

- Unhitch the spring **6** at the automatic decompressor shaft **7** and at the same time pull the autodecompressor shaft out of the camshaft.
- Loosen the 2 bolts **8** and take off the camshaft wheel **9**.
- Use the puller tool to pull the grooved ball bearing **10** off the camshaft.

Clean all components, check them and if necessary replace them with new components.

Camshaft

Check bearing seats and cams for wear.

Renew grooved ball bearings **5** and **10**

Autodecompressor shaft **7**

Check bearing for play and contact surface to the rocker arm for wear.

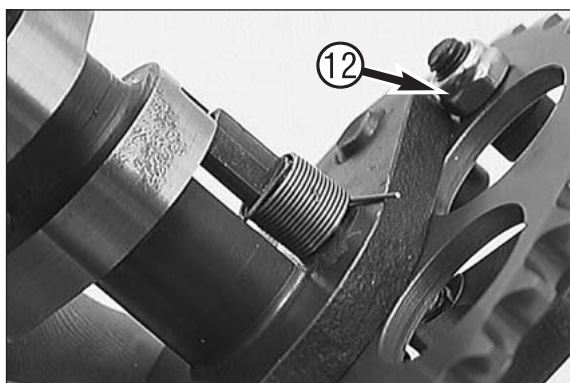
Camshaft wheel **9**

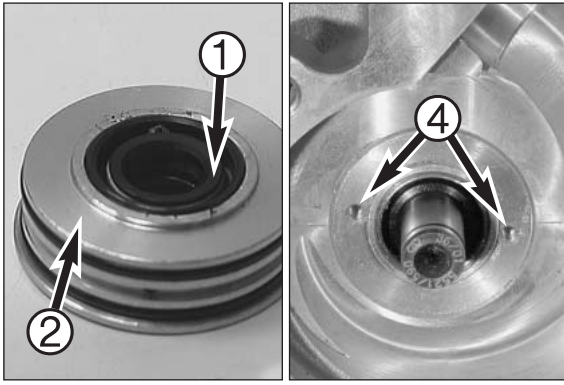
Check teeth for wear.

Check the bolt **11** for tight fit.

NOTE:

- The self-locking nut **12** was replaced by a normal nut starting with the 2002 model. Secure the nut with Loctite 222 and tighten to 8 Nm – see Technical Information 0111/36/02 for models up to 2001.
- Screw **11** was replaced by a bolt firmly connected to the camshaft gear starting with the 2003 model.

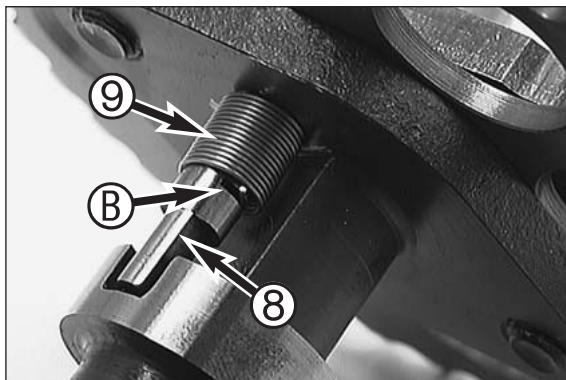
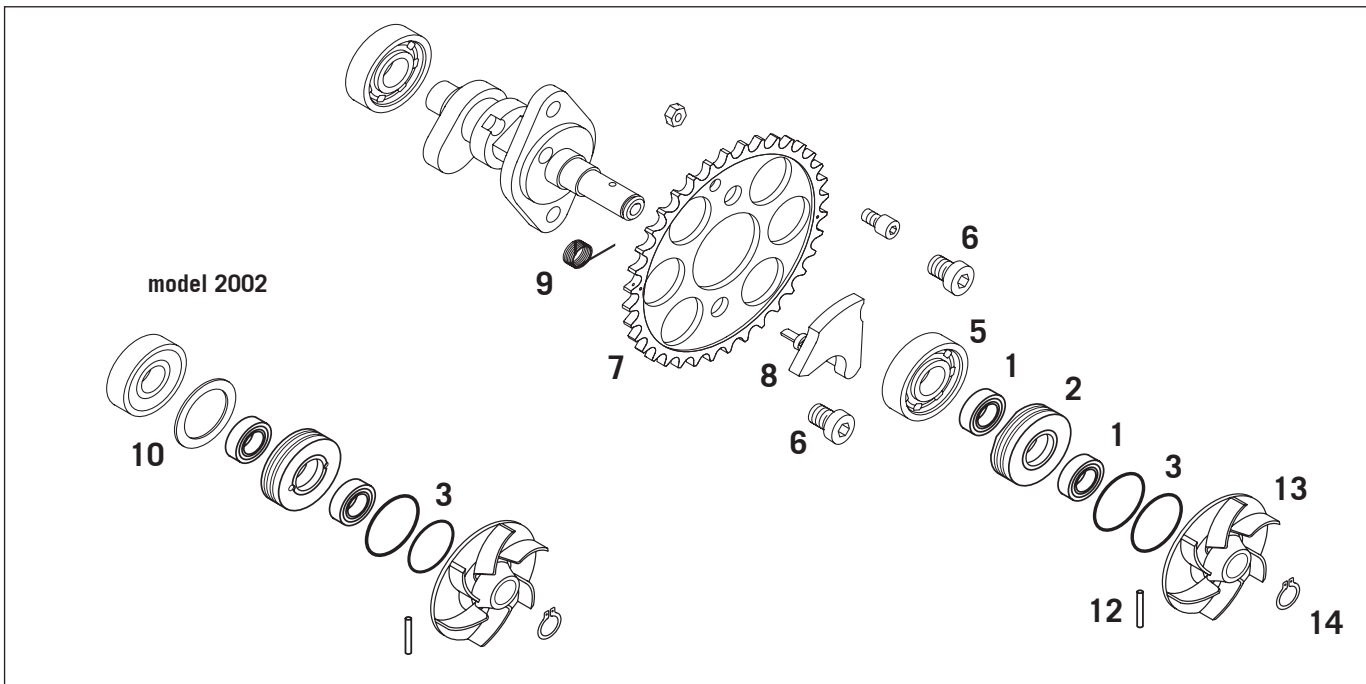




- Press the shaft seal rings ① out of the gasket carrier ②.
- Press the new shaft seal rings in up to a flush position, with the open side facing outwards. Thoroughly grease the sealing lips.
- Take the 2 O-rings ③ off the gasket carrier and remove the gasket residues with a wire brush.
- Mount 2 new O-rings.

NOTE:

- The two O-rings ③ have different sizes starting with the 2002 model. The smaller O-ring is mounted on the outside, i.e. facing the water pump wheel.
- The flat marks of the rear side of the gaskets carrier are necessary only if the gasket carrier is to be taken out with the timing chain mounted, the flat marks make the fitment of the gasket carrier easier.
- Starting with the 2002 model, the gasket carrier can be pulled out of the cylinder head with the two M3 threads ④ without having to remove the top part of the cylinder head.



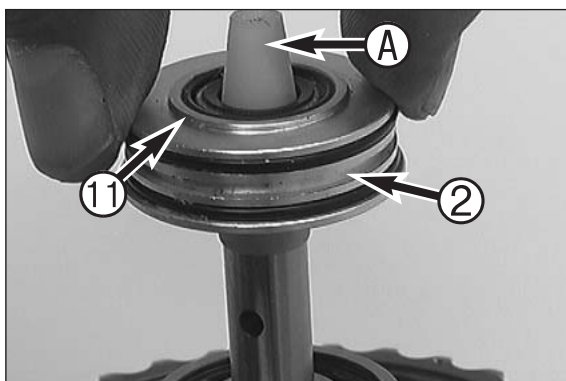
Preassembling the camshaft

- Coat the threads of the 2 bolts ⑥ with Loctite 243 and mount the camshaft wheel ⑦. Tighten bolts to 28 Nm.
 - For preassembly, press on the grooved ball bearing ⑤ by means of a hollow punch.
 - Mount the autodecompressor shaft ⑧ and the spring ⑨. Preload the spring by approx. 1/2 turn and insert the end of the spring into the groove ⑧.
- Now, check whether the autodecompressor shaft turns back into its initial position by itself. If not, increase the preloading of the spring.
- Slide on the washer ⑩ (only applies to the 2002 model).

The following steps only apply to models up to 2001

(see page 6-12 for models from 2002 onwards)

- Slide on the mounting sleeve ① and mount the gasket carrier ② with the collar ⑩ facing the camshaft wheel.

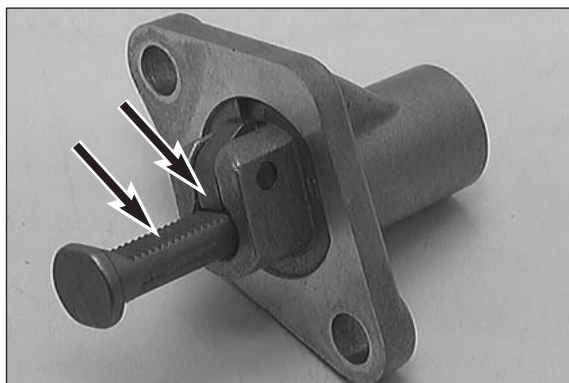


! CAUTION !

IT IS IMPERATIVE THAT YOU USE THE MOUNTING SLEEVE. OTHERWISE YOU WILL DAMAGE THE SHAFT SEAL RING.

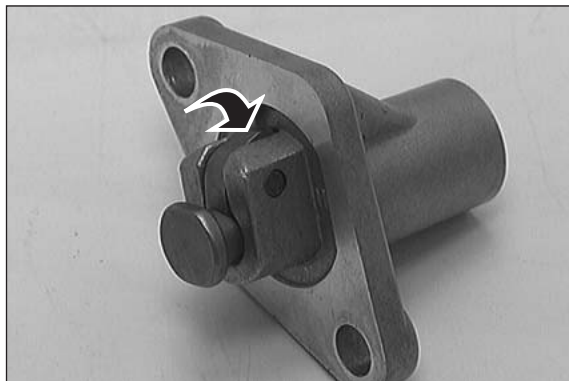
- Dismount the mounting sleeve, insert the needle roller ⑫ into the camshaft and mount the water pump wheel ⑬ with the circlip ⑭.

NOTE: From Model 2001 onwards the length of the needle roller is 17.8 mm (0.7007 in); Model 2000: 13.8 mm (0.5433 in). The needle roller and water pump wheel are only changeable as a set.

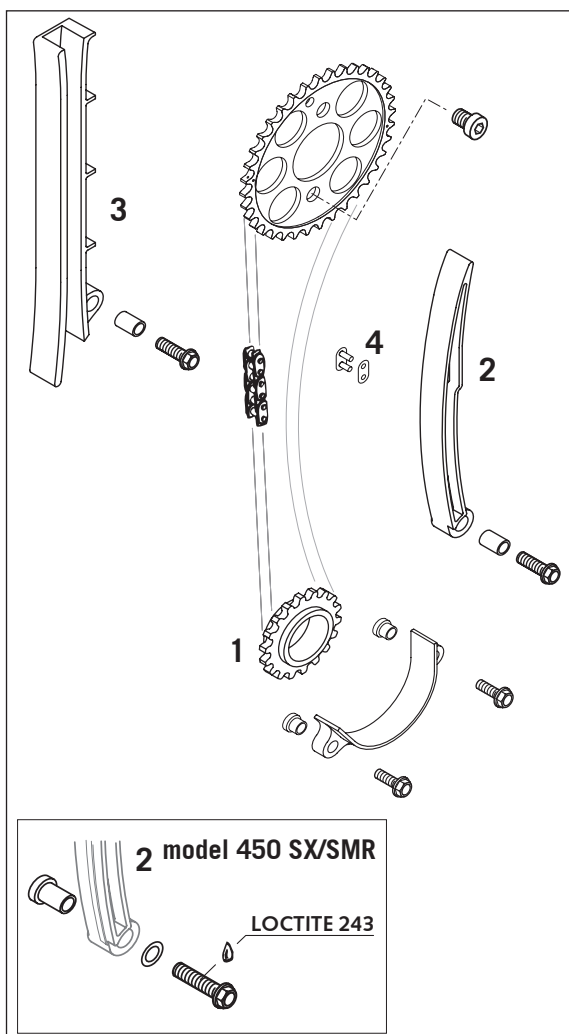


Timing chain tensioner

- Pull the pressure pin of the timing chain tensioner out all the way and check whether or not it moves smoothly.
- Check the tothing on the pressure pin and the ratcheting pawl for wear.



- For mounting, push the ratchet in the direction of the arrow so that the pressure pin will no longer be locked and push the pressure pin all the way into the tensioner housing.



Timing train

Clean all components thoroughly and check them for wear.

Timing gear ❶

Check the tothing for broken-off parts and wear.

Timing chain tensioner rail ❷

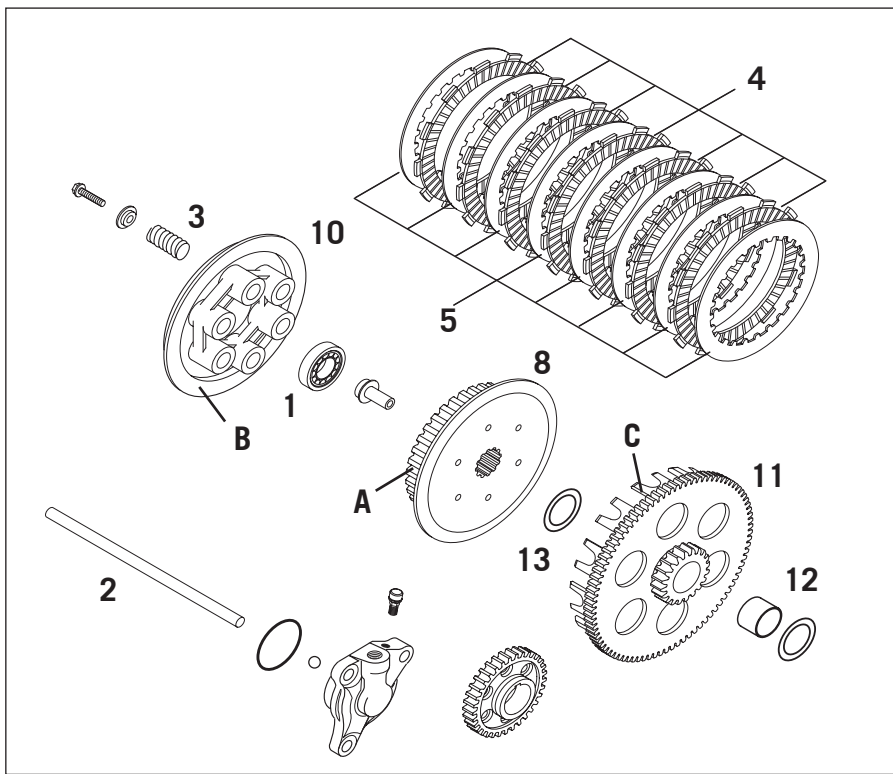
Check for seizing marks at the contact surface.

Timing chain guide ❸

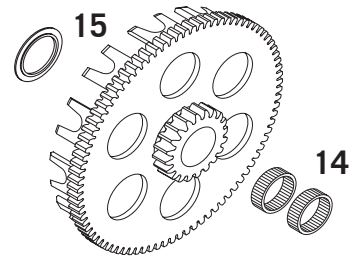
Check for seizing marks at the contact surface.

Rivet link ❹

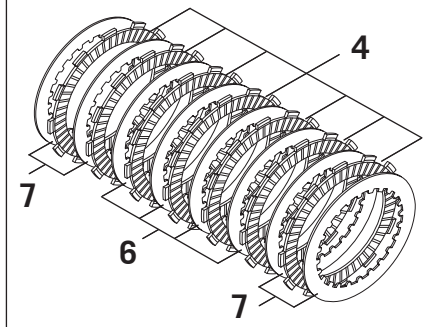
The opened rivet link of the timing chain must be replaced.



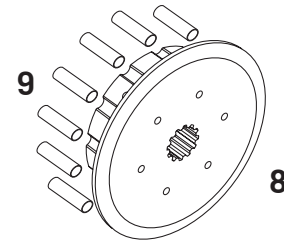
Modification - Model 2001



Modification - Model 2002



Modification - Model 2002



Checking the clutch for wear

Thrust bearing ①

Check it for seizing marks and unobstructed movability.

Push rod ②

Place it on a planar surface and check it for eccentricity.

Clutch springs ③

Minimum length: 42 mm, new: 43 mm; if necessary, replace all 6 springs.

7 lining discs ④

Minimum thickness: 1.7 mm, new: 1.8 mm. The lining discs must be planar.

8 intermediate discs ⑤ (up to model 2001)

They must be planar. Check them for mechanical damage. In the case of punctual broken-off portions, you have to replace the intermediate discs.

Four 1.4 mm ⑥ clutch disks (models from 2002 onwards)

Must be planar. Check for mechanical damage. Replace clutch disks if localized points are broken off.

Four 1.0 mm ⑦ clutch disks (models from 2002 onwards)

Must be planar. Check for mechanical damage. Replace clutch disks if localized points are broken off.

Inner clutch hub ⑧

Check the outer toothing ① on the inner clutch hub. If the depressions are greater than 0.5mm, the inner clutch hub must be replaced. A modified driver with sleeves ⑨ is installed starting with the 2002 model.

Pressure cap ⑩

Check the seating surface ② of the steel disc for damage.

Outer clutch hub ⑪

Check the stop surfaces ③ of the lining disk and the clutch cage for wear. If the depressions are greater than 0.5 mm the lining disk and clutch hub must be replaced.

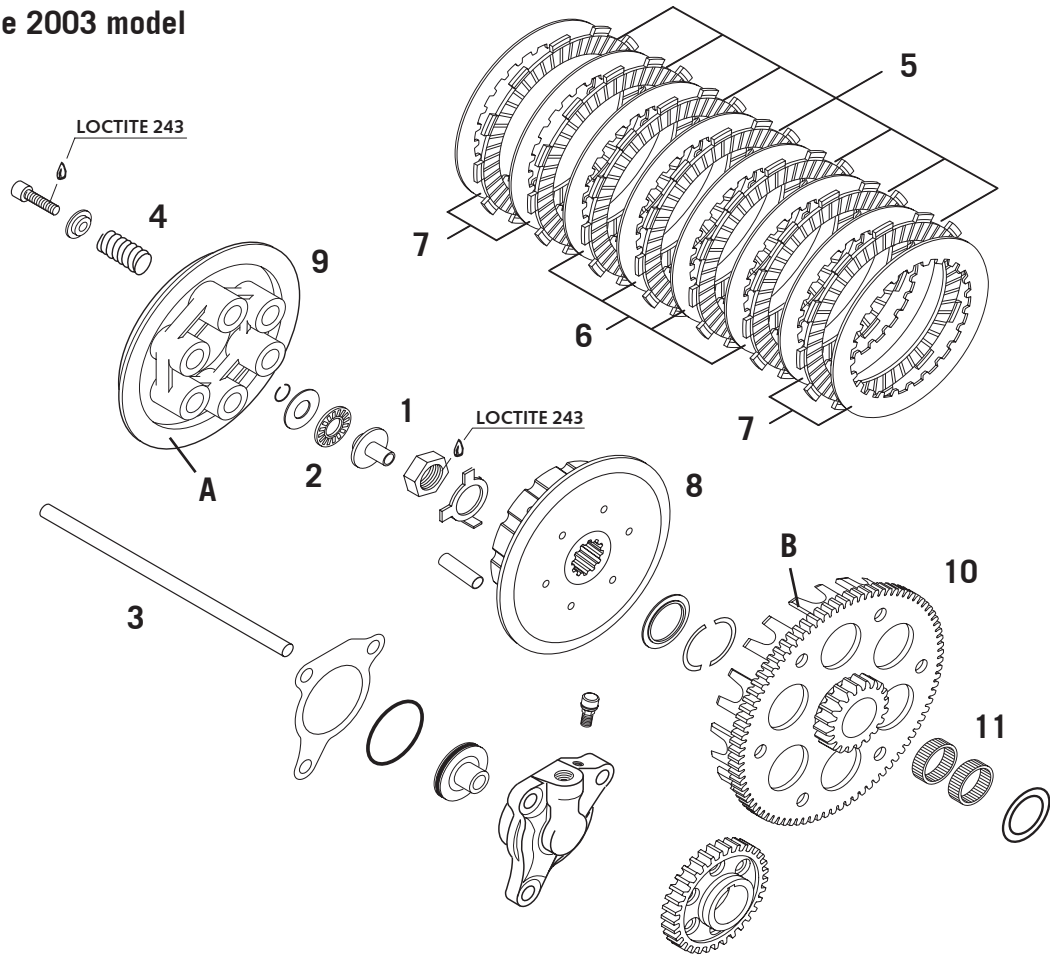
Bearing bush ⑫

Slip the bearing bush and the outer clutch hub on the main shaft and check the bearing for clearance. If necessary, replace the bearing bush.

NOTE:

- Every time the inner clutch hub is replaced, the bearing bush should be exchanged as well (Model 2000).
- from Model 2001 onwards two needle bearings ⑬ are mounted instead of the bearing bush ⑫, the outer clutch hub is replaced with a hardened version, the support washer ⑭ is replaced with a step washer ⑮ and the mesh of the shaft is different.

From the 2003 model



Checking the clutch for wear

Pressure piece ①

Check it for seizing marks and unobstructed movability.

Axial needle bearing ②

Check for damage.

Push rod ③

Place it on a planar surface and check it for eccentricity.

Clutch springs ④

Minimum length: 42 mm, new: 43 mm; if necessary, replace all 6 springs.

7 lining discs ⑤

Model 2003: Minimum thickness: 1.7 mm, new: 1.8 mm.

Model 2004: Minimum thickness: 1.9 mm, new: 2 mm.

The lining discs must be planar.

Model 2003: Four 1.4 mm ⑥ clutch disks

Must be planar. Check for mechanical damage. Replace clutch disks if localized points are broken off.

Model 2003: Four 1.0 mm ⑦ clutch disks

Must be planar. Check for mechanical damage. Replace clutch disks if localized points are broken off.

NOTE: The clutch disks all have the same thickness (1 mm) from the 2004 model.

Inner clutch hub ⑧

Check for seizing marks and damage.

Pressure cap ⑨

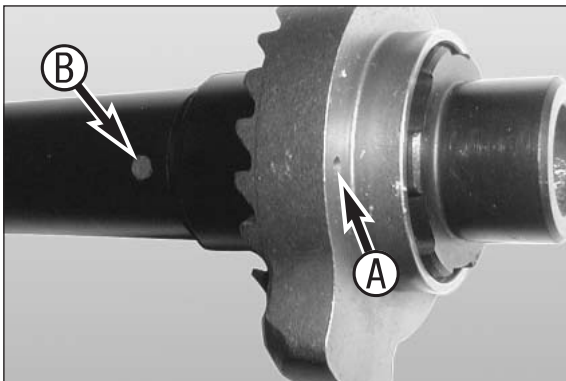
Check the seating surface ④ of the steel disc for damage, check the oil holes (starting with the 2005 model) for free passage.

Outer clutch hub ⑩

Check the stop surfaces ⑤ of the lining disk and the clutch cage for wear. If the depressions are greater than 0.5 mm the lining disk and clutch hub must be replaced.

Needle bearing ⑪

Check for seizing marks and damage.



Take all components off the kickstarter shaft and clean them.

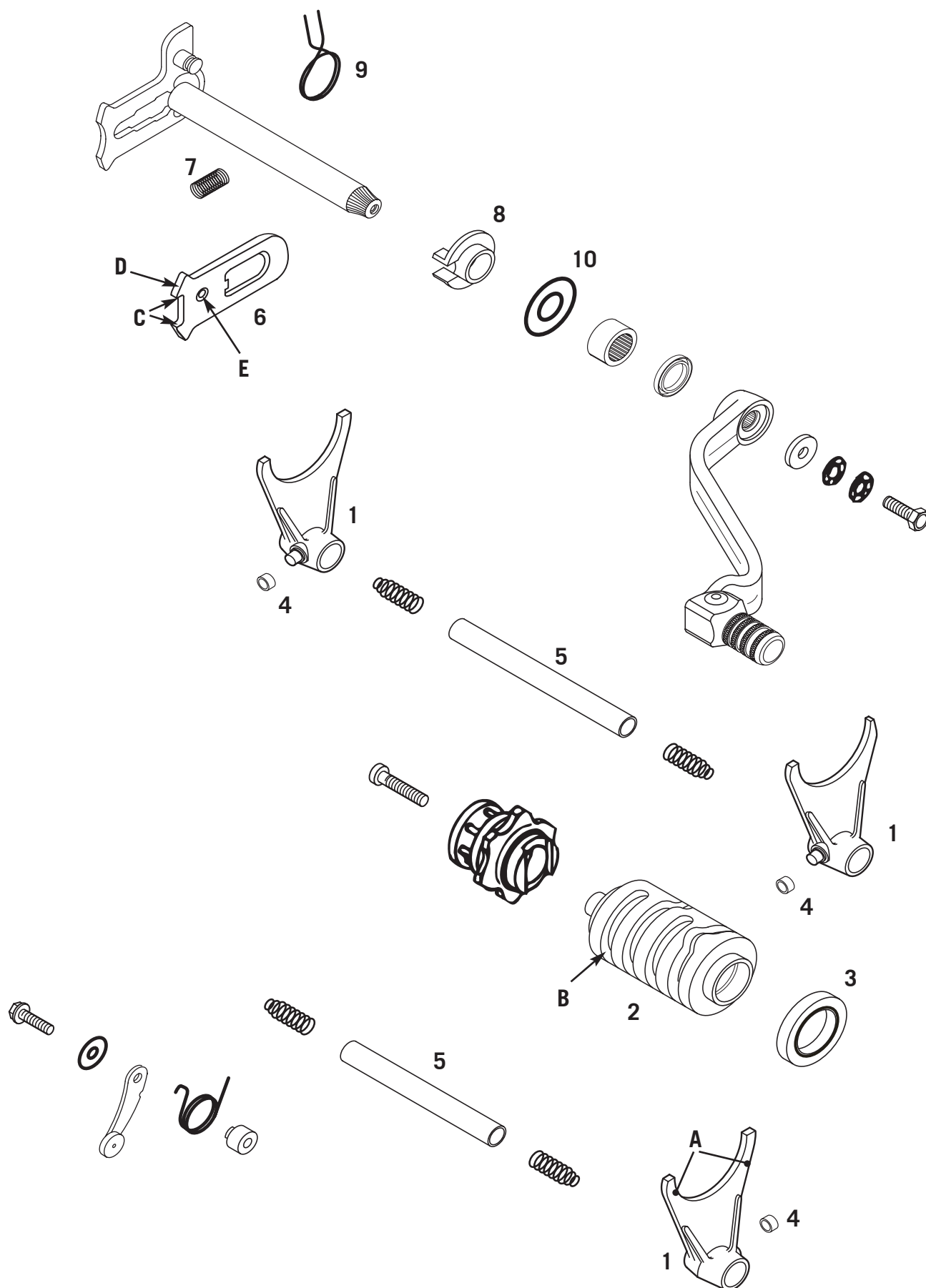
Check the toothing for wear and the bearing for clearance.

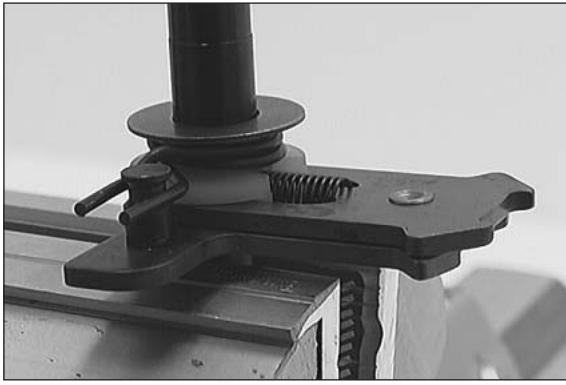
Check the bearing for clearance and seizing marks. Check the tothing for wear. It is constantly engaged with the outer clutch hub.

Check the inclined surface and the toothings for wear.

Check bearing positions and toothings for wear and damage. Check the oil bore for the kickstarter gear for unobstructed passage.

- Clamp the kickstarter shaft ④ with the toothed end facing upward into a vise (use protection jaws).
- Mount stop disc ⑤, needle bearing ⑥ and kickstarter gear ① with the locking teeth facing downward.
- Slip on the stop disc ⑦ and mount the circlip ⑧ with the sharp edge facing upward.
- Mount the driving hub ⑨ such that the recess is located above the bore in the kickstarter shaft.
- Mount kickstarter spring ⑩ and hook starter spring leg into kickstarter shaft bore.
- Unclamp the kickstarter shaft.
- Slip the kickstarter ratchet gear ③ on the kickstarter shaft such that the marks A mates with the oil duct B in the kickstarter shaft.
- Mount the ratchet gear spring ⑪ and the stop disc ⑫ on the kickstarter shaft.





Shift mechanism

Shift forks ①

Check plate **A** for wear. The forks are 4.8mm - 4.9 mm thick in a new condition. The wear limit is at 4.6 mm.

Shift roller ②

Check the shift grooves **B** for wear.

Check the fit of the shift roller in the grooved ball bearing **③**.

Grooved ball bearing ③

Check it for smooth movability.

Shift rolls ④

Check the shift rolls for pressure marks and cracks.

Shift rails ⑤

Check the shift rails for eccentricity on a planar surface. Check the shift rails for score and seizing marks. The smooth movability of the shift forks on the shift rails must be ensured.

Sliding plate ⑥

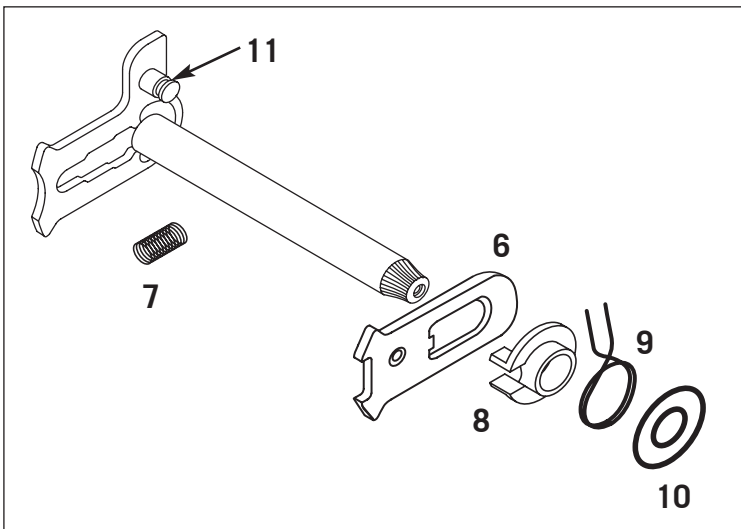
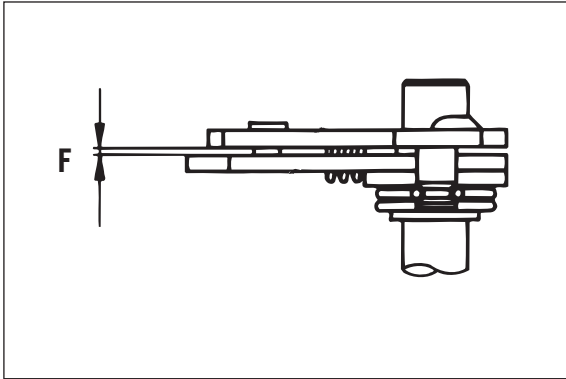
Check it for wear at the points of engagement **⑩**.

Check the return surface **⑪** on the sliding plate for wear (replace it in case of severe notching).

Check the guide bolts **⑤** for tight fit and wear.

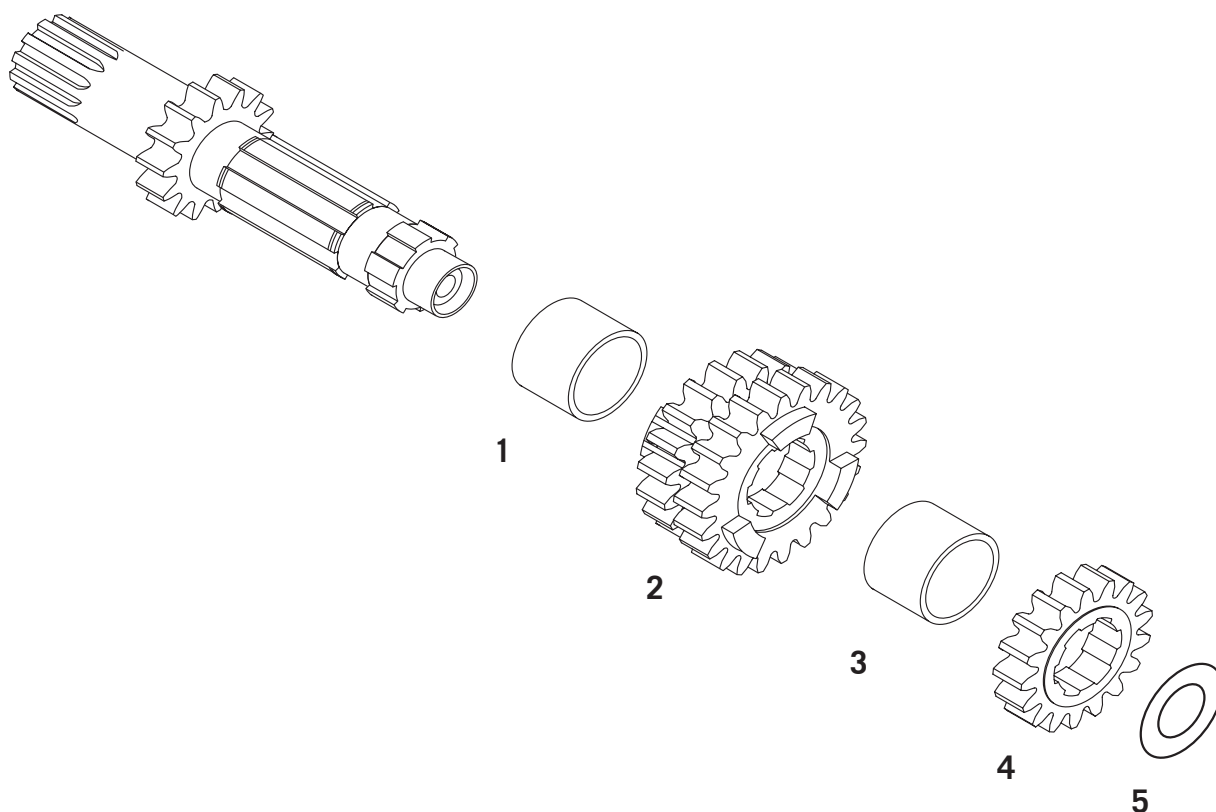
Shift mechanism

Preassemble the shift shaft and check the clearance **F** between the sliding plate **⑥** and the shift element. The clearance must be 0.40 - 0.80 mm.



Preassembling the shift shaft

- Secure the short end of the shift shaft in a vise (use protection jaws).
- Mount the sliding plate **⑥** with the guide bolt facing downward and engage the guide bolt at the shift element.
- Mount the pressure spring **⑦**.
- Slide on the spring guide **⑧**, slide the return spring **⑨** with its dropped end facing upward over the spring guide and lift the dropped end over the counterbearing bolt **⑪** (see photo).
- Mount the stop disc **⑩**.



Transmission

Clamp the main shaft or countershaft, respectively, into the vise (use protective jaws). Remove the gears and check the following parts for wear and grooves:

- Bearings
- Pivot points of the main shaft and countershaft and pivot points of the idler gears
- Shift dogs of the gears
- Tooth faces of all gears
- Tooth profiles of the main shaft and countershaft as well as of the corresponding gears
- Check the profiles of all control gears for smooth operation

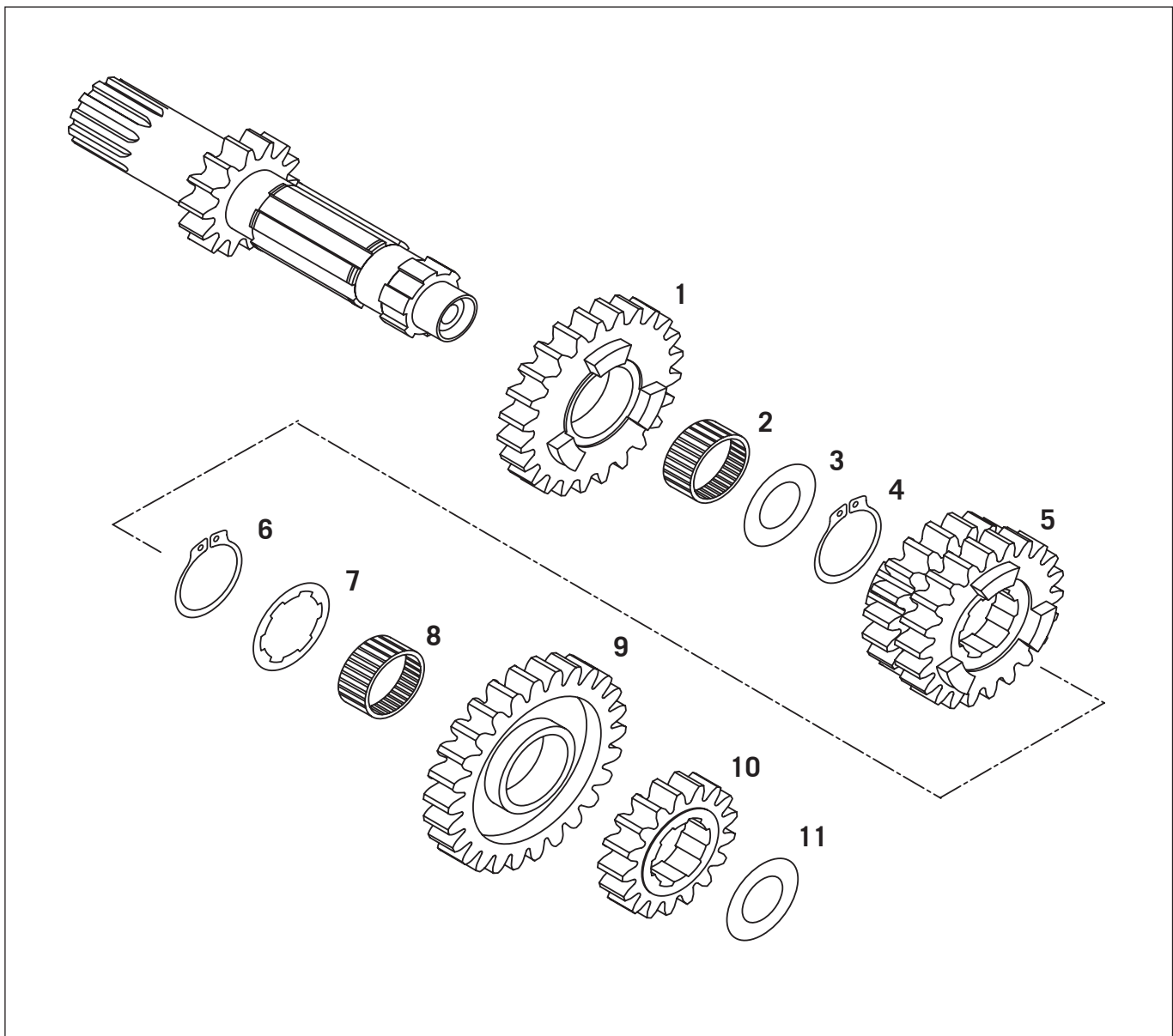
Thoroughly clean all parts, exchange damaged components. New axial securing elements should be mounted whenever repair work is performed.

Assembling the main shaft (4-speed)

- Secure the main shaft with the toothed end facing downward in a vise (use protection jaws).
- Prior to assembly, oil all components thoroughly.
- Mount the spacer bushing ❶ and the 3rd/4th speed sliding gear ❷ with the small gear facing downward.
- Mount the spacer bushing ❸ and the 2nd speed fixed gear ❹ with the collar facing downward.
- Slip on the stop disc ❺ (17.2x30x1 mm).
- Then, check all gear wheels for smooth movability.

NOTE: From Model 2001 onwards the spacer bushings ❶ and ❸ are made of steel (before they were made of aluminium), the steel version can be used in Model 2000 gearboxes.





Transmission

Clamp the main shaft or counter shaft, respectively, into the vise (use protective jaws). Remove the gears and check the following parts for wear and grooves:

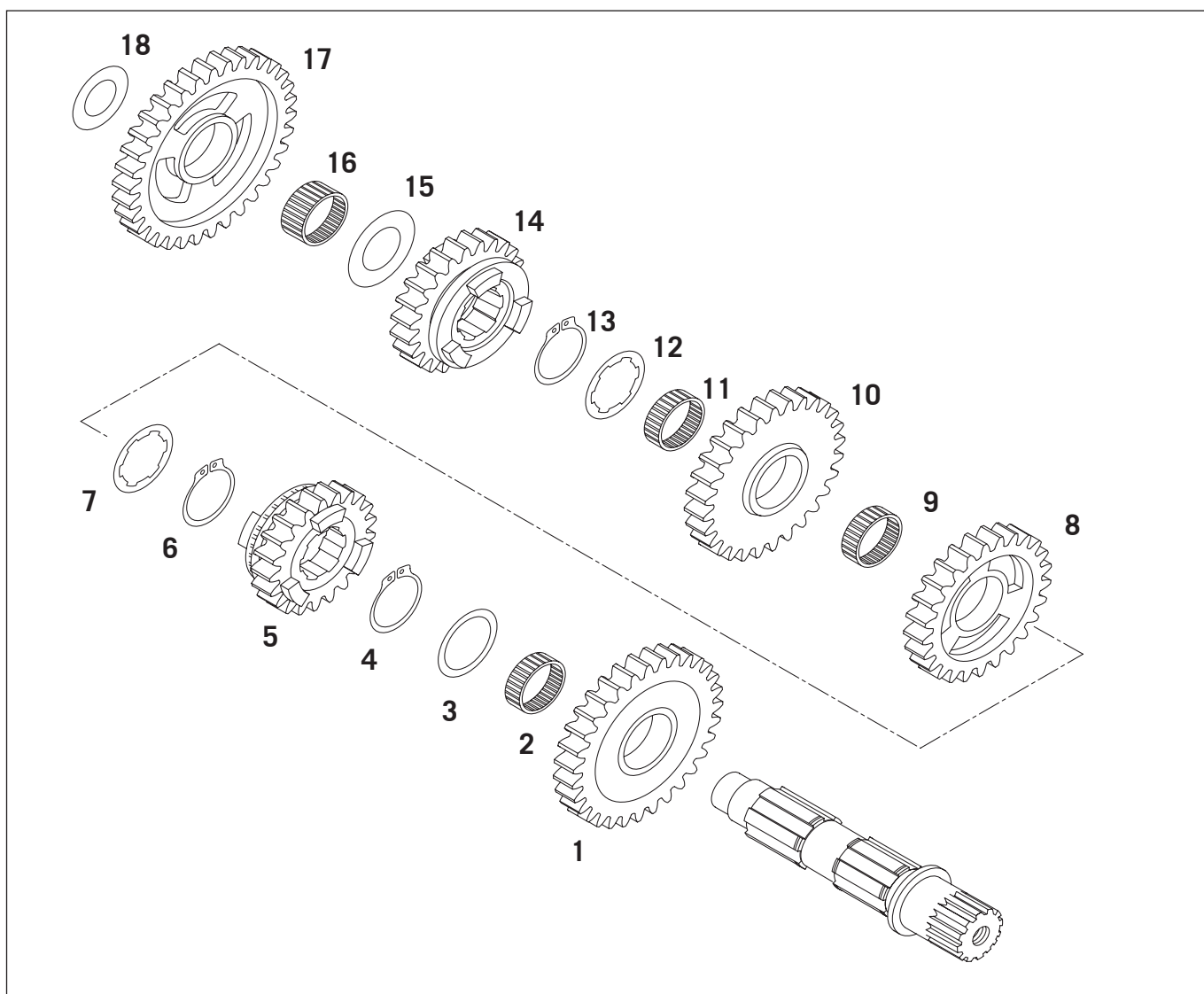
- Bearings
- Pivot points of the main shaft and countershaft and pivot points of the idler gears
- Shift dogs of the gears
- Tooth faces of all gears
- Tooth profiles of the main shaft and countershaft as well as of the corresponding gears
- Check the profiles of all control gears for smooth operation

Thoroughly clean all parts, exchange damaged components. New axial securing elements should be mounted whenever repair work is performed.

Assembling the main shaft (6-speed)

- Secure the main shaft with the toothed end facing downward in a vise (use protection jaws).
- Prior to assembly, oil all components thoroughly.
- Mount the split needle bearing **2**, slip on the 5th speed idler gear **1** with the shift dogs facing upward.
- Mount the stop disc **3** (25.2x32x1.5 mm) and the circlip **4** with the sharp edge pointing upward.
- Slip on the 3rd/4th speed sliding gear **5** with the small gear facing downward and mount the circlip **6**.
- Slip on the stop disc **7** (25.2x32x1.5 mm) and the split needle bearing **8**.
- Slip on the 6th speed idler gear **9** with the recess pointing upward.
- Slip on the 2nd speed fixed gear **10** with the collar facing downward and the stop disc **11** (17.2x30x1 mm).
- Then, check all gear wheels for smooth movability.





Transmission

Clamp the main shaft or countershaft, respectively, into the vise (use protective jaws). Remove the gears and check the following parts for wear and grooves:

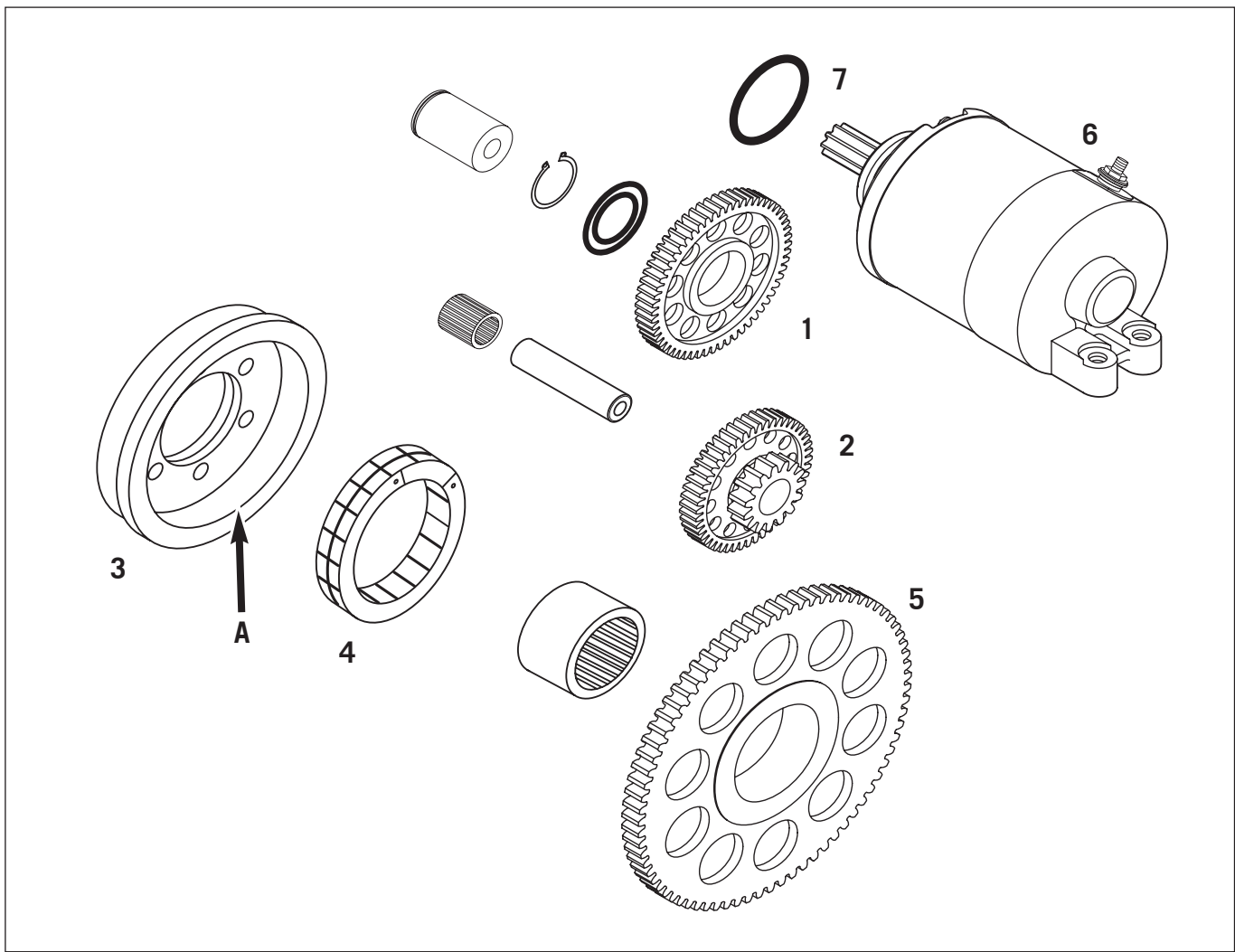
- Bearings
- Pivot points of the main shaft and countershaft and pivot points of the idler gears
- Shift dogs of the gears
- Tooth faces of all gears
- Tooth profiles of the main shaft and countershaft as well as of the corresponding gears
- Check the profiles of all control gears for smooth operation

Thoroughly clean all parts, exchange damaged components. New axial securing elements should be mounted whenever repair work is performed.

Assembling the countershaft (4 and 6-speed)

- Secure the countershaft with the toothed end facing downward in a vise (use protection jaws).
- Prior to assembly, oil all components thoroughly.
- Mount the split needle bearing **2** and the 2nd speed idler gear **1** - with the recess for shift dogs facing upward - on the countershaft.
- Mount the stop disc **3** (25.2x32x1.5mm) and circlip **4** with the sharp edge facing upward.
- Mount the 6th speed sliding gear **5** with the shift groove facing upward.
- Mount the circlip **6** and the stop disc **7** (25.2x32x1.5mm).
- Mount the 2 split needle bearings **9** + **11** and the 4th speed idler gear **8** with the recess for shift dogs facing downward.
- Mount the 3rd speed idler gear **10** with the recess for shift dogs facing upward.
- Mount the stop disc **12** (25.2x32x1.5mm) and the circlip **13**.
- Slip on the 5th speed sliding gear **14** with the shift groove facing downward and the stop disc **15** (20x32x1mm).
- Mount the needle bearing **16**, the 1st speed idler gear **17** with the recess facing downward and the stop disc **18** (17.2x30x1.5mm).





E-starter drive gear

Idler gear ❶

Check toothing and bearing position of the idler gear for wear. Check the bearing bolts of the idler gear for score marks, as well.

Reduction gear ❷

Check toothing and bearing position of the reduction gear for wear. Check the bearing bolts of the reduction gear for score marks, as well. Slip the reduction gear together with the needle cage onto the bearing bolt and check the clearance.

Free wheel hub ❸

Take the free wheel out of the free wheel hub and check the contact surface **A** for pressure marks. Clean the free wheel hub thoroughly.

Free wheel ❹

Thoroughly clean the free wheel with petroleum and compressed air. Check the segments of the free wheel for wear. Then, oil the free wheel thoroughly.

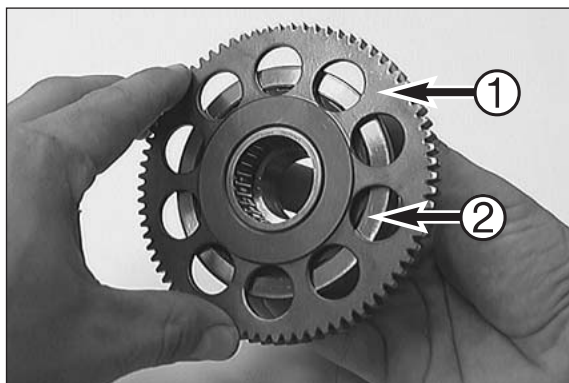
Free wheel gear ❺

Slip the free wheel gear onto the crankshaft and check for clearance. If necessary, replace the needle bush. Check the contact surface to the free wheel for pressure marks.

NOTE: If damage is found on the reduction gear ❷ or on the free wheel gear ❺ forcing you to change parts, then ❷ and ❺ are only available as a set.

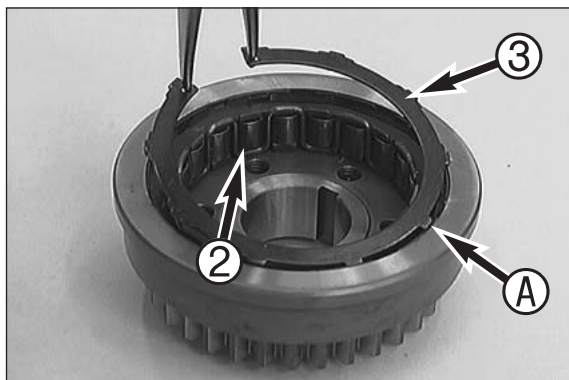
E-starter motor ❻

Renew the O-ring ❼ at the flange.



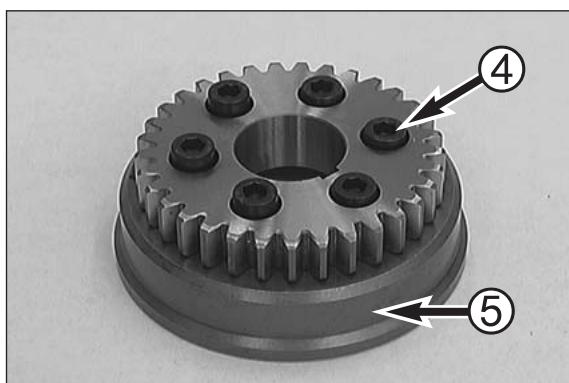
Checking the free wheel

- Insert the free wheel gear ① into the free wheel ②.
- It must be possible to turn the free wheel gear clockwise.
- Counterclockwise, the free wheel gear must be blocked without backlash.

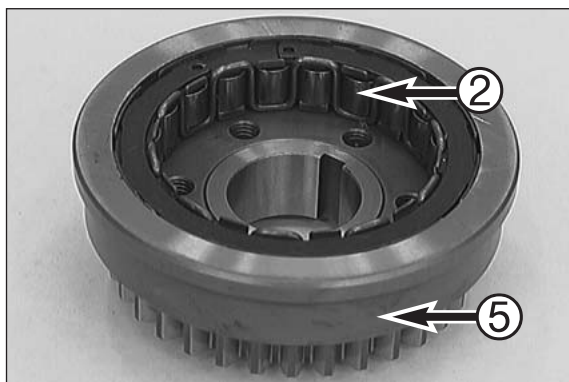


Replacing the free wheel hub

- Use the circlip pliers to compress the spreader ring ③ and remove it together with the free wheel ②.



- Remove the 6 bolts ④.
- Use a plastic hammer to tap on the free wheel hub ⑤ from the side and dismount the free wheel hub.
- Mount the new free wheel hub on the primary wheel.
- Degrease the threads of the bolts, apply Loctite 648 and tighten the bolts in a crosswise order to 16 Nm.



- Oil the free wheel ② thoroughly and insert it into the free wheel hub ⑤.
- Use circlip pliers to insert the spreader ring into the groove and check its proper fit. It is best to use a punch to carefully tap on the mounted spreader ring.

NOTE: The noses ① on the spreader ring must engage the groove of the free wheel hub.

ASSEMBLING THE ENGINE

6

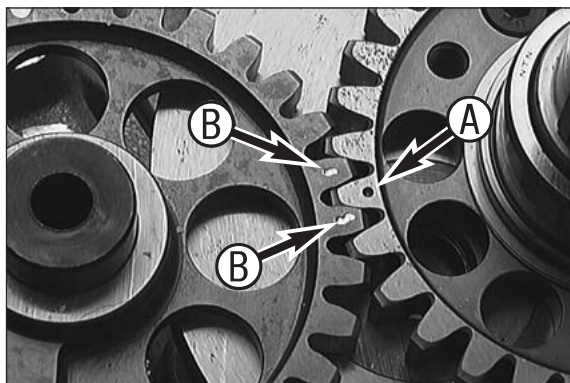
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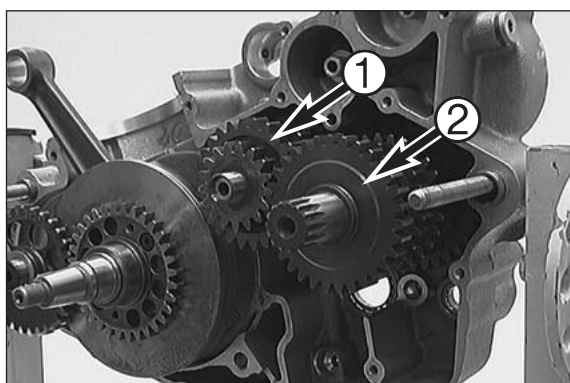


Mounting the crankshaft and balancer shaft

- Secure the right half of the casing in the work stand.
- Thoroughly oil the cylinder roller bearings of the crankshaft and grease the shaft seal ring of the crankshaft.
- Carefully, insert the crankshaft into the bearing seat.

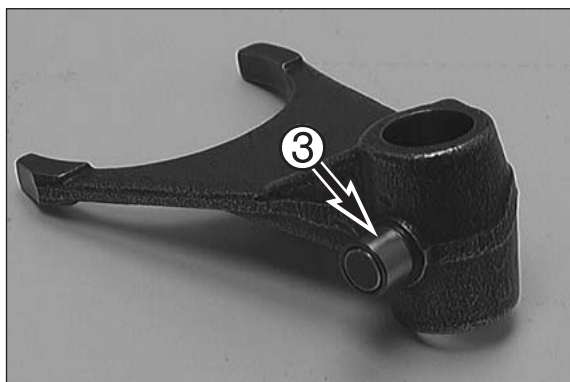


- Turn the crankshaft such that the mark **A** is in front and insert the balancer shaft into the bearing seat. Make sure that the mark **A** on the crankshaft is between the 2 marks **B** on the balancer shaft.

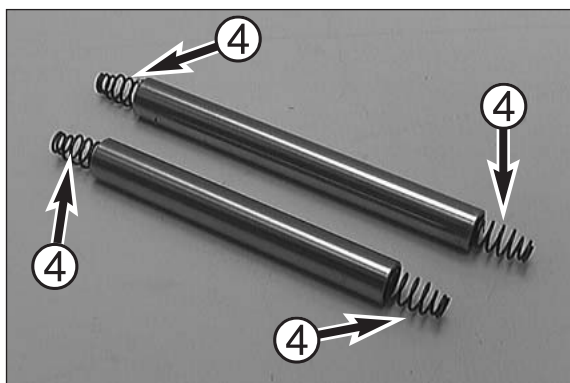


Mounting the shift mechanism and transmission

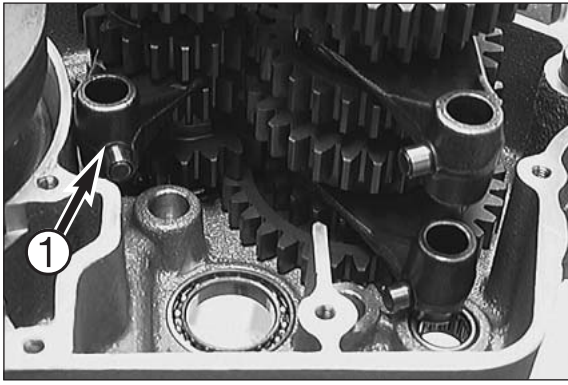
- Turn the engine sideward.
- Insert main shaft **1** and countershaft **2** into the bearing seats simultaneously.



- Apply grease to secure the shift rolls **3** to the shift forks.



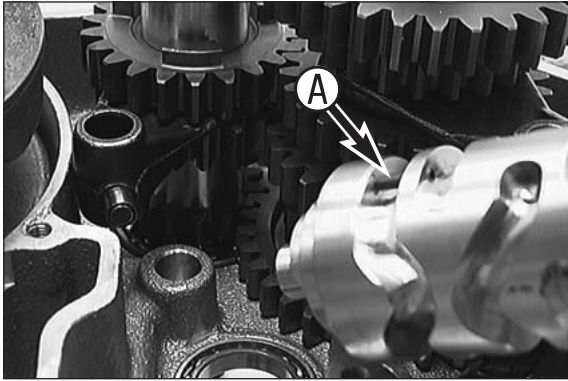
- Apply grease to secure the 4 springs **4** in the shift rails.



- Oil the shift forks at their flat sides and engage them in the sliding gears.

ONLY ENGINES WITH 4-SPEED-SHIFTING:

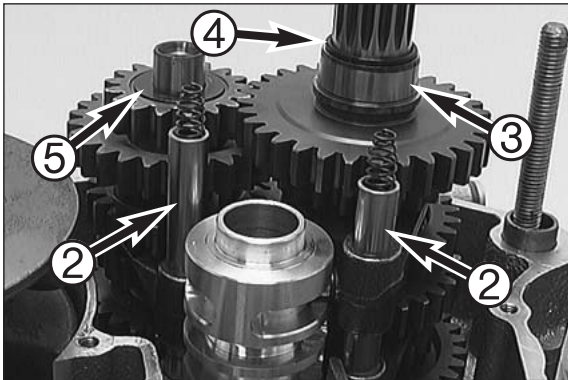
NOTE: The shift fork ❶ and the short shift rail is not mounted in these engines.



- Insert shift roller into bearing seat.

ONLY ENGINES WITH 4-SPEED-SHIFTING:

NOTE: The shift roller must be turned with the shift roller mounted such that the pin ❸ faces vertically downward.



- Engage the shift forks in the shift roller and mount the two shift rails ❷ together with the springs.

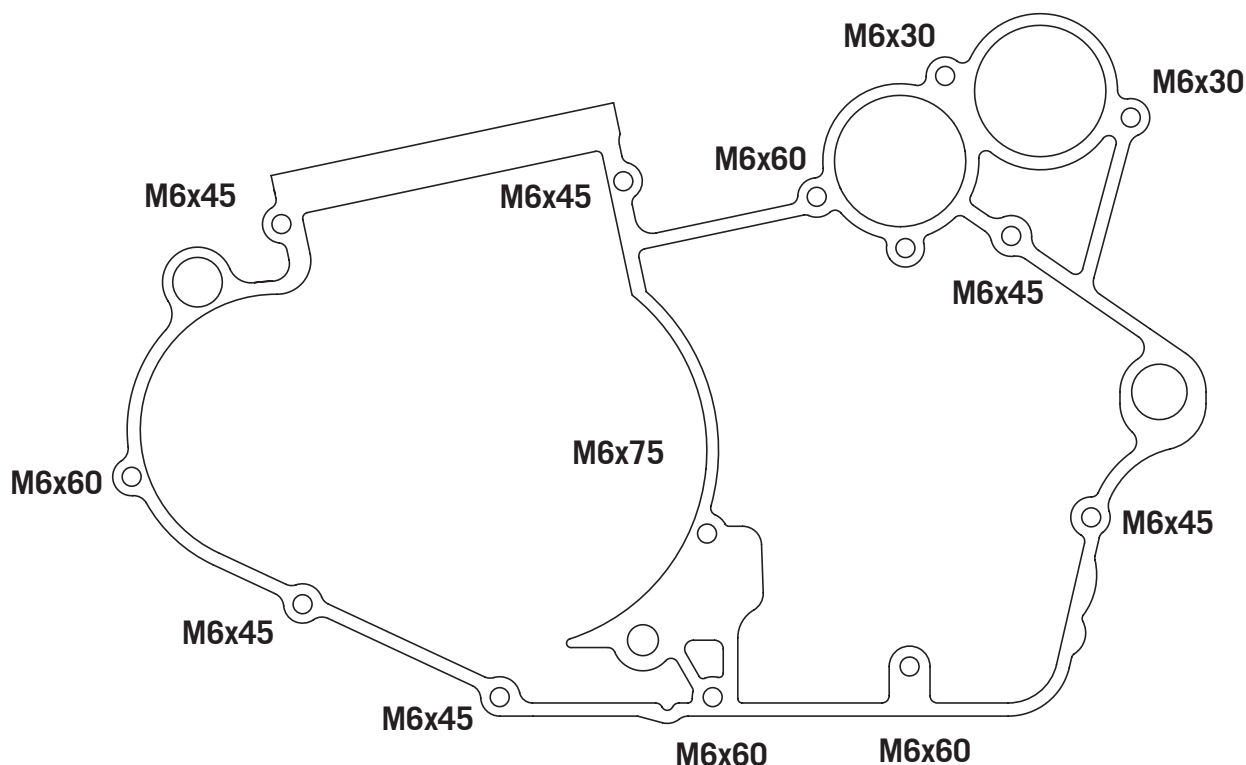
- Make sure that the following parts were mounted:

inner bearing ring ❸

O-ring ❹

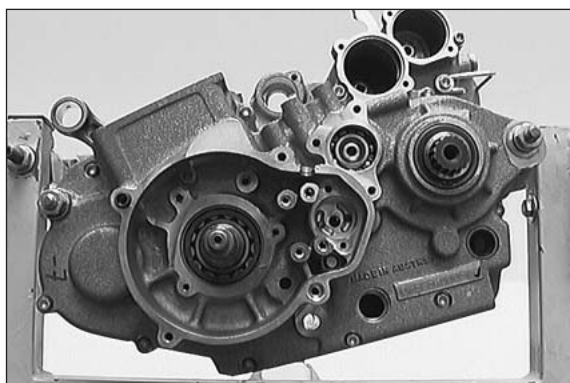
stop disc ❺

2 dowels in the engine casing



Assembling the engine casing

- Remove the engine fixture at the work stand.
- Slightly coat the casing sealing surface with grease and apply a new gasket to it.
- Put on the left half of the casing and tap on it lightly with a plastic hammer until it reaches its proper fit.
- Check the casing gasket for proper fit.
- Grease the casing bolts in the area of their threads and at the seating surfaces of their heads. Insert the bolts and tighten them (the bolt length is indicated in the drawing).
- Prior to and after tightening the casing bolts to 10 Nm, check whether all shafts move smoothly.
- Fix the engine to the work stand.
- Cut the projecting casing gasket at the cylinder base away neatly at the sealing surfaces.



Mounting the primary gear and the freewheel

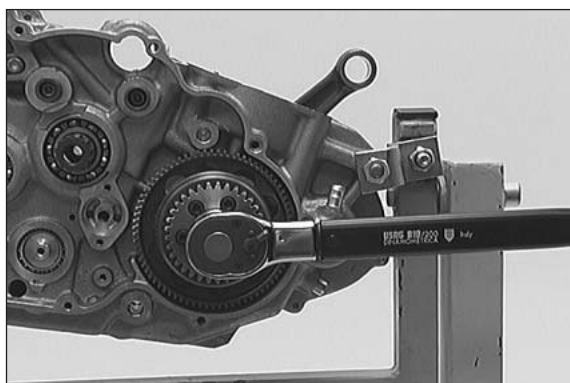
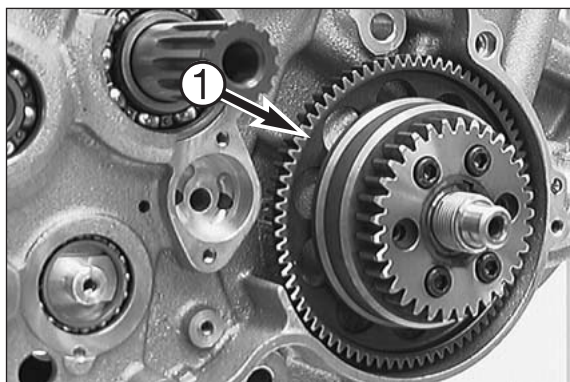
400/520 models until 2002:

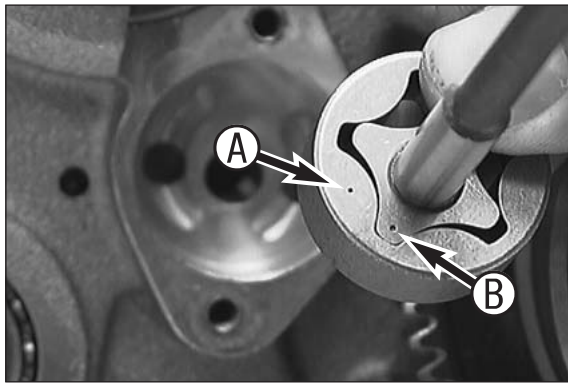
- Turn the crankshaft to TDC and mount the crankshaft fixing bolt without a sealing ring.
- Check if the Woodruff key has been mounted in the crankshaft.
- Thoroughly oil the free wheel and the needle cage in the free wheel gear.
- Insert the free wheel gear ❶ into the free wheel hub and push all parts onto the crankshaft simultaneously.
- Degrease the thread of the crankshaft and coat it with Loctite 243. Mount the collar nut and tighten to 150 Nm.

250 EXC models from 2002 and all models after 2003:

- Check if the Woodruff key has been mounted in the crankshaft.
- Thoroughly oil the free wheel and the needle cage in the free wheel gear.
- Insert the free wheel gear ❶ into the free wheel hub and push all parts onto the crankshaft simultaneously.

NOTE: The collar nut on the primary gear will be mounted later.

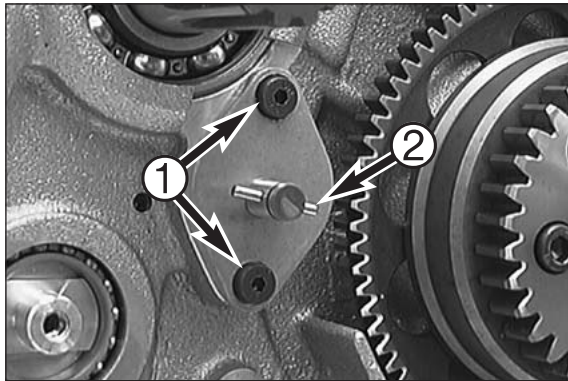




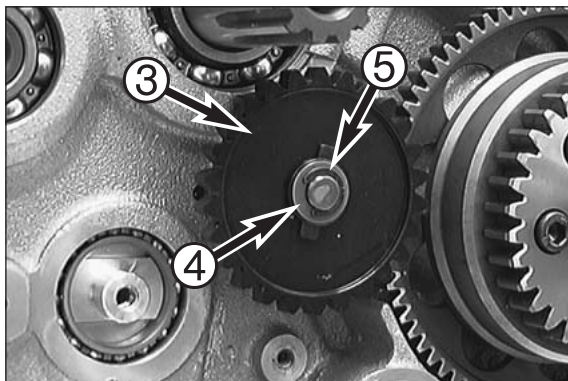
Mounting the oil pumps

- Thoroughly clean the seating surface of the oil pump cover.
- Insert the needle roller into the oil pump shaft.
- Slide inner rotor and outer rotor onto the oil pump shaft such that the 2 center points **A** and **B** are located next to one another and insert all components into the engine casing.

NOTE: The inner and outer rotor must be mounted with the center points facing the casing.

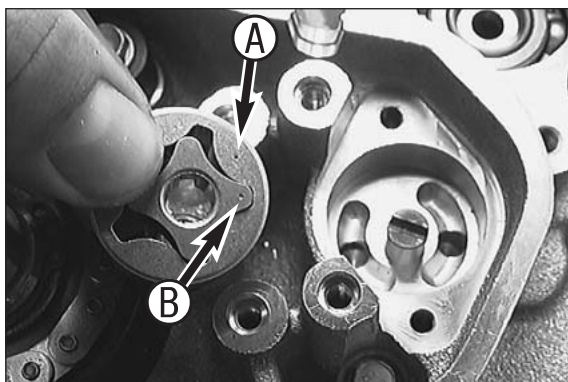


- Fill the oil pump casing with engine oil.
- Degrease the threads of the 2 bolts **1** (M5x12), apply Loctite 222 mount the oil pump cover and tighten the bolts to 6 Nm.
- Insert the needle roller **2** into the bore of the oil pump shaft.



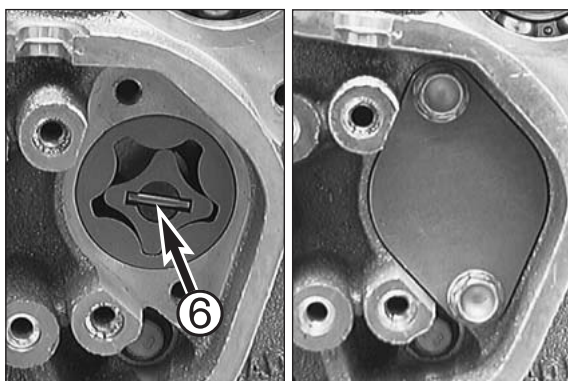
NOTE: If the shift lock has been removed, it can easily be mounted at this point (see page 6-6).

- Slide on the oil pump wheel **3**, mount the stop disc **4** and the tab washer **5**.
- By turning the oil pump wheel, check whether the oil pump shaft moves smoothly.

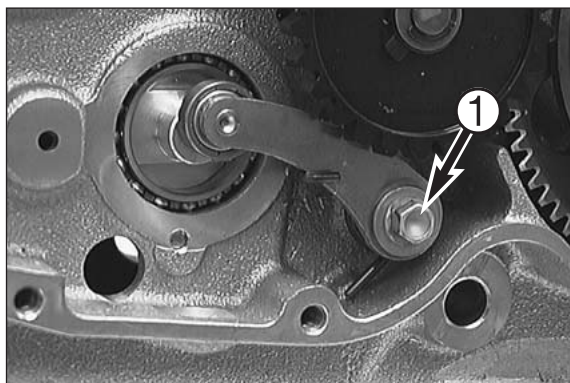


- Wipe the seating surface of the oil pump cover clean.
- Insert the outer and inner rotors into the engine casing such that the two marks **A** and **B** are located adjacent to one another.

NOTE: The inner and outer rotor must be mounted with the center points facing the casing.

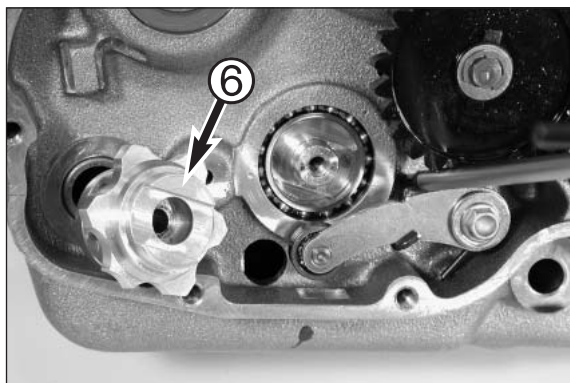
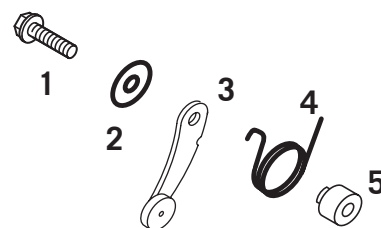


- Mount the needle roller **6**.
- Degrease the threads of the 2 bolts (M5x16) and coat them with Loctite 222.
- Fill the oil pump casing with engine oil.
- Use the 2 bolts to fix the oil pump cover and tighten to 6 Nm.
- After mounting check the oil pumps for easy operation. For this purpose turn the oil pump wheel.

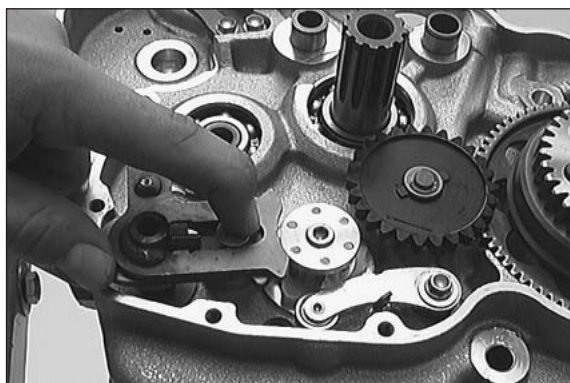


Mounting the shift arrester

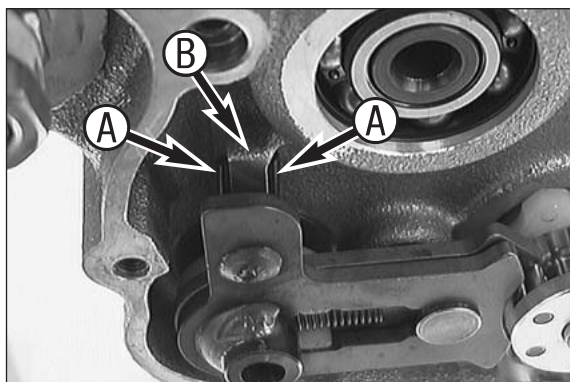
- Slip the disc **2**, the locking lever **3**, the locking spring sleeve **4** and the locking lever spring **5** onto the bolt **1** (M5x20).
- Apply Loctite 243 to the bolt's thread and tighten the bolt to 6 Nm.



- Slide the shift locating drum **6** onto the shift roller. Please note that the flat portions are eccentric. Here, the locking lever has been drawn away from the shift roller.
- Apply Loctite 243 to the thread of the bolt **7** (M6x30) and tighten the bolt to 10 Nm.



- Grease the preassembled shift shaft and, together with the stop disc, slide it into the bearings until the sliding plate abuts the roller driving pin.
- Push back the sliding plate and push the shift shaft in up to the stop.

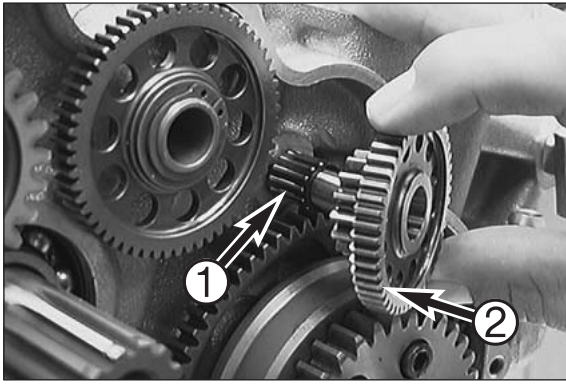


- Check whether the legs **A** of the return spring abut the casing nose **B** on both the left and right sides.
- Slip on the shift lever and shift through all gears. Turn the main shaft as you shift through the gears. Then, dismount the shift lever again.

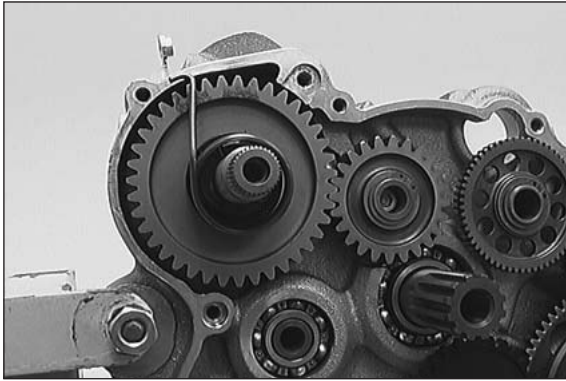


Mounting E-starter drive gear and kickstarter

- Oil the kickstarter idler gear **8** and the E-starter idler gear **9** at the bearing positions and slide them onto the bearing bolts.
- Mount stop discs and circlips with the sharp edge facing outwards.



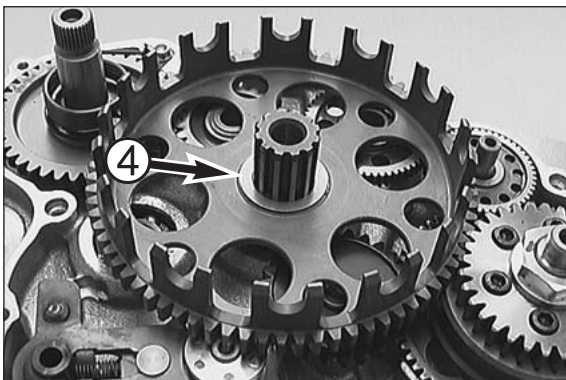
- Insert the bearing bolt into the casing bore. Mount the needle bearing ① and the reduction gear ②.



- Insert the preassembled kickstarter shaft into the bearing bore such that the ratchet gear is positioned behind the release plate.



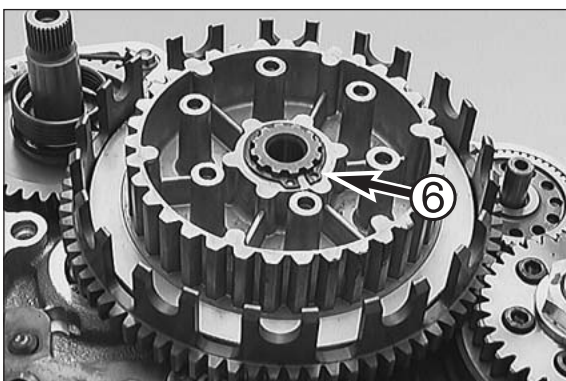
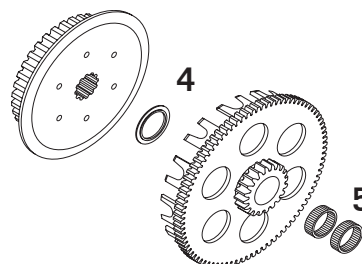
- Mount the spring shackle to the starter spring, coat the thread of the bolt ③ (M6x12) with Loctite 243, tighten to 10 Nm, preload the starter spring around approx. 45° clockwise and fix the spring shackle by means of the bolt.
- Align the starter spring such that the distance to the kickstarter shaft is the same all around.



Mounting the outer clutch hub and driver up to the 2002 model

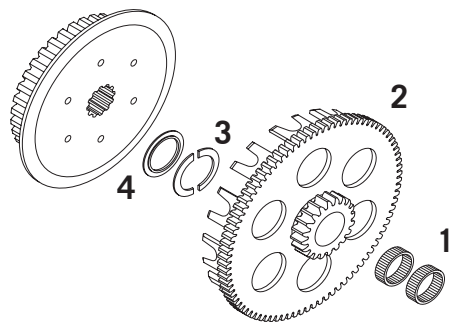
- Mount the stop disc and the bearing bush.
- Oil the bearing bush, slip the outer clutch hub and the stop disc ④ onto the main shaft.

NOTE: From Model 2001 onwards the support washer ④ is replaced by a step washer and two needle bearings ⑤ are mounted instead of the bearing bush (see drawing below). These parts cannot be used for Model 2000 engines.



- Heat the driving pin to approx. 150°C and slide it onto the main shaft.
- Mount the circlip ⑥ with its sharp edge facing upwards.

NOTE: A used driving pin can usually be mounted without being heated.



Mounting the outer clutch hub and driver from the 2003 model onwards

- Mount the supporting plate and the oiled needle bearing ①.
- Mount the outer clutch hub ② together with the half disks ③ and stepped disk ④ on the main shaft.



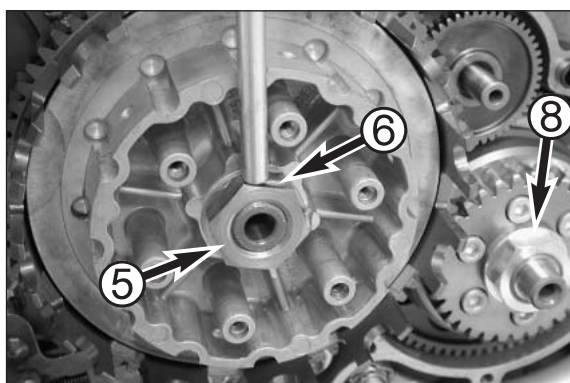
- Heat the driver to approx. 150°C and mount on the main shaft.
- Mount a new lock washer.
- Mount the collar nut ⑤ with a new lock washer ⑥.
- Pull out the starter idler shaft, the starter idler gear will remain in the engine case.
- Block the outer clutch hub with the special tool 590.29.003.100 ⑦ (see photo) and tighten the collar nut to 120 Nm.
- Secure the collar nut with a lock washer as illustrated.

NOTE: A used driver can usually be mounted without heating.

Mounting the primary gear nut (250 EXC models after 2002 and all models after 2003)

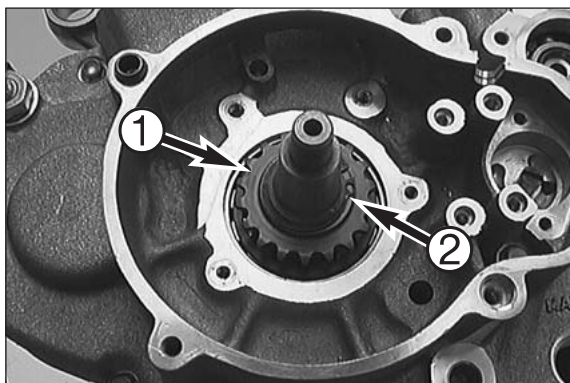
- Apply the special tool 590.29.003.100 ⑦ as illustrated.
- Degrease the crankshaft thread and apply Loctite 243. Mount the collar nut ⑧ and tighten to 120 Nm - left-hand thread!

NOTE: The nut was already mounted on the models up to 2002.



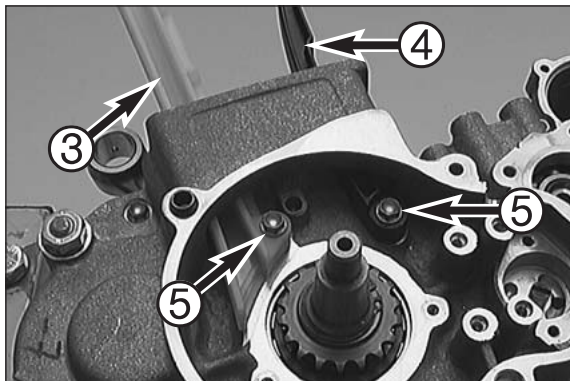
- Turn the crankshaft to TDC and mount the crankshaft fixing bolt without a sealing ring.



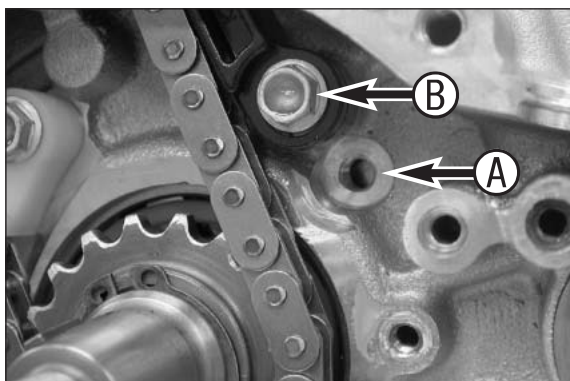


Mounting the timing gear

- Check the Woodruff key in the crankshaft for its correct fit.
- Warm the timing gear ① and position on the crankshaft with the high collar facing inwards. Tap carefully with a suitable pipe if necessary.
- Mount circlip ② with the sharp edge facing outwards.



- Degrease the threads of the 2 bolts and apply Loctite 243. Use the 2 bolts ⑤ (M6x25) to fix the timing chain guide ③ and the tensioning rail ④, tighten the bolts to 8 Nm. Do not forget the 2 bushings.

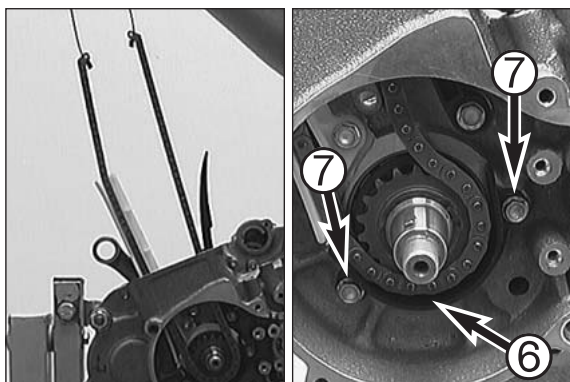


NOTE: 2 mounting points for the tensioning rail are provided for models from 2003. The tensioning rail is attached to point A on the 450 SX model.

The tensioning rail is attached to point B on all other models.

! **CAUTION** !

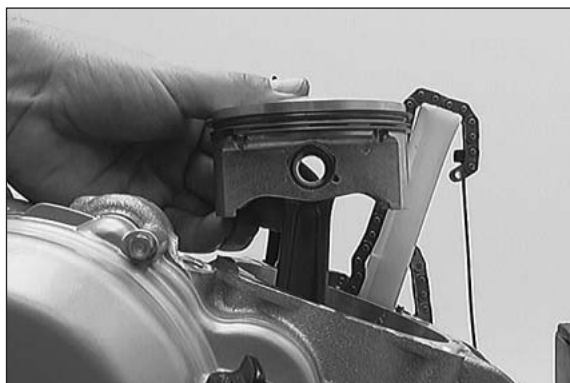
AFTER TIGHTENING, CHECK THE TENSIONING RAIL FOR SMOOTH OPERATION.



- Place the timing chain such that both ends are of equal length.

NOTE: The timing chain can also be pulled in after the cylinder and cylinder head are mounted.

- Degrease the threads of the 2 bolts (M5x16) and coat them with Loctite 243. Mount the fall-out protection element ⑥ and tighten the bolts ⑦ to 6 Nm.
- Stick one cable strap each through the 2 ends of the timing chain (see photo).



Mounting piston and cylinder

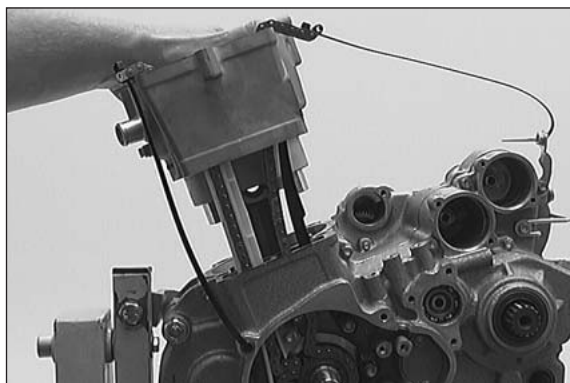
- Apply a new cylinder-base gasket.
- Oil the piston pin boss in the conrod and the piston pin.
- Mount the piston and secure the piston pin with 2 new wire circlips.

!

CAUTION

!

THE ARROW AT THE PISTON HEAD MUST POINT IN THE TRAVEL DIRECTION.



- Oil the piston and align the piston rings.

NOTE: The open end of the oil scraper ring must be in the back. The open end of the compression ring must be offset from it around 90°.

- Pull the timing chain upward through the chain tunnel.
- Slide the cylinder over the piston and remove the piston mounting ring.

!

CAUTION

!

EXERCISE EXTREME CAUTION WHEN MOUNTING THE CYLINDER! THE OIL SCRAPER RING CAN BREAK EASILY.



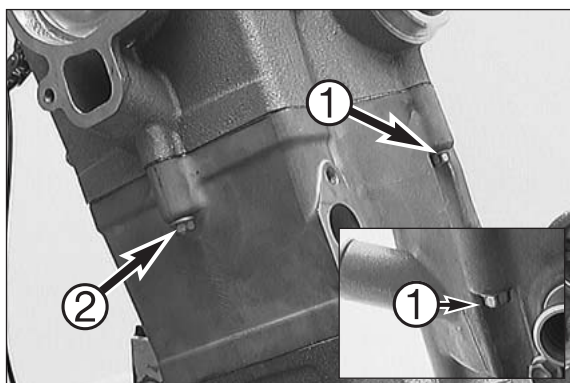
Mounting the cylinder head

- Check the two dowels in the cylinder for perfect fit.
- Apply a new cylinder-head gasket (the labeling "ALTO" facing upward) and mount the cylinder head. At the same time, insert the timing chain.

NOTE: see Technical Information

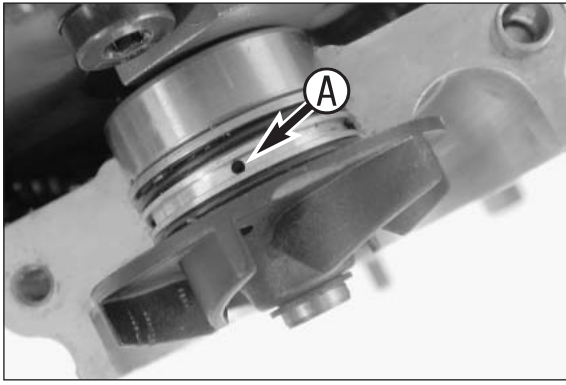


- Oil the 4 collar bolts at their threads and their seating surfaces and mount them together with the washers.
- Tighten the collar bolts in a crosswise order as follows.
- At first, tighten them only until you feel a light resistance.
- The second time around, tighten the bolts to 40 Nm.
- The third time, tighten them to 50 Nm.

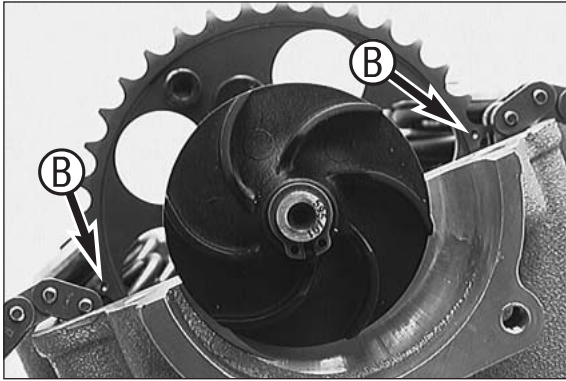


- Mount and tighten bolts ① (M6x45) and ② (M6x40) and tighten to 10 Nm.

NOTE: The shorter bolt ② (M6x40) must be mounted on the left, in the region of the water pump with a new copper seal ring(6x10x1).

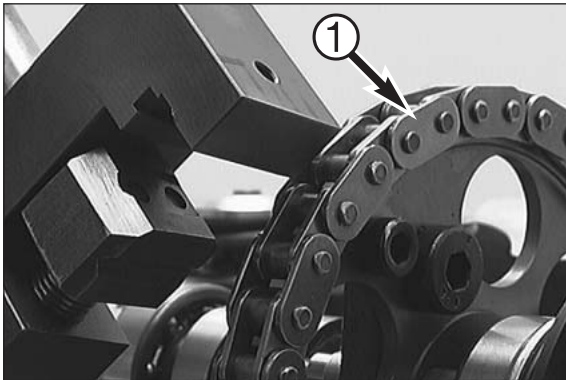


NOTE: The gasket carrier has a drain bore **A** from the 2003 model. Make sure the bore faces up when mounting.

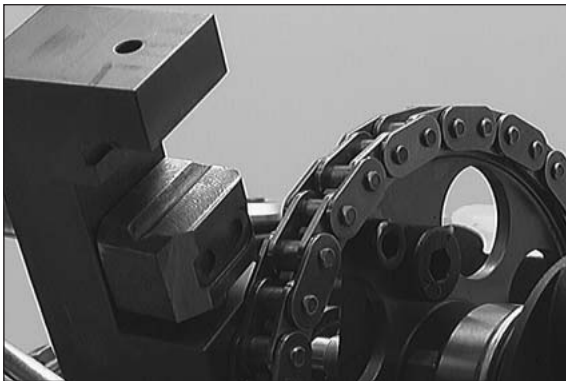


- Place the camshaft into the cylinder head such that the marks **B** at the camshaft gear are aligned with the upper edge of the cylinder head (see photo). The stop bolt of the automatic decompressor must be on top.

NOTE: When mounting the camshaft, you have to use the crankshaft fixing bolt to block the crankshaft in the TDC position.

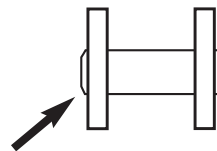


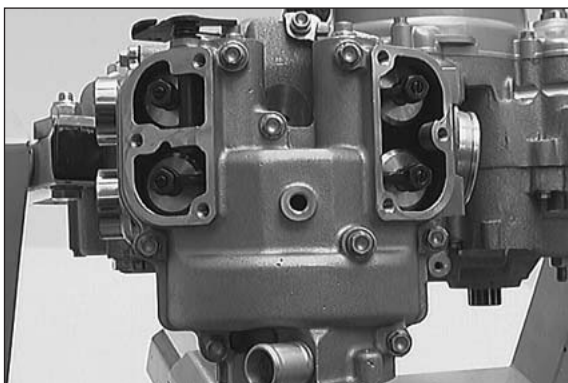
- Place the timing chain onto the camshaft gear and mount a new rivet link **1**.
- At first, mount the socket of the special tool 590.29.020.000 as shown and then compress the rivet link.



- Mount the socket of the special tool as shown and rivet on the rivet link.

NOTE: The rivet member must be riveted on so tightly that the ends of the inserting member have a trapezoid-shaped cross-section (see drawing).

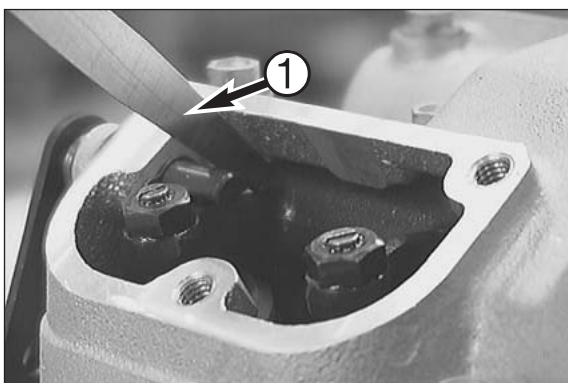
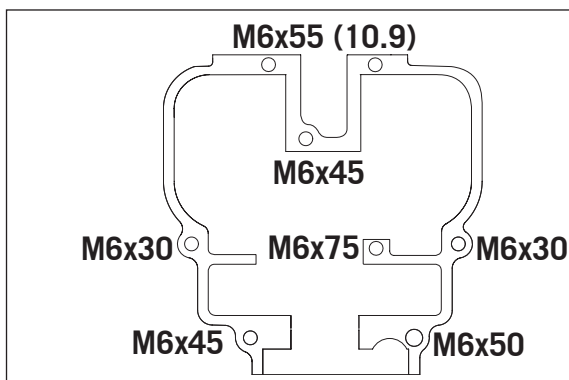




Mounting cylinder head top portion

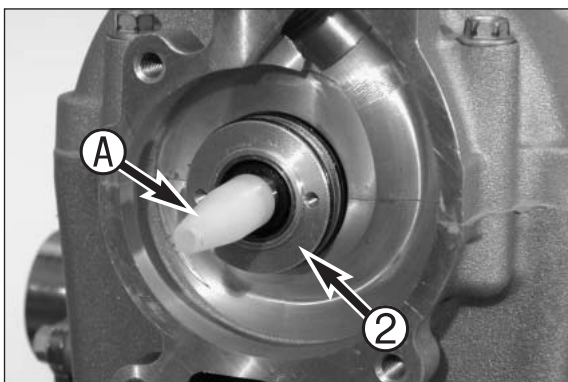
- Clean and degrease the sealing surface.
- Fit dowels.
- Apply a thin layer of sealing compound (Three Bond).
- Carefully position cylinder head top section and tighten bolts to 10 Nm.

NOTE: The bolt M6x75 is to be mounted with a new copper seal ring (6x10x1).



- Prior to fastening the bolts, it is necessary to check and, if necessary, adjust the clearance play of the rocker arms.
- For this purpose, insert a feeler gauge ❶ (0.05 mm) between the end piece and rocker arm. Press the end piece inwards and tighten the bolt in the area of the end piece.
- Tighten the remaining bolts in a crosswise order to 10 Nm.

Axial clearance rocker arms 0.02 - 0.10 mm



The following steps only apply to models from 2002 onwards:

- Slip on the assembling sleeve 590.29.005.010 ❶. Grease the O-rings and mount the gasket carrier ❷ without canting, the collar facing the camshaft gear.

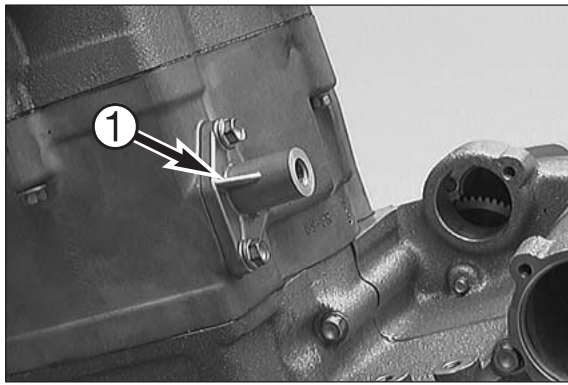
! CAUTION !

ALWAYS USE THE ASSEMBLING SLEEVE TO PREVENT THE SHAFT SEALING RINGS FROM BEING DAMAGED.

NOTE: The gasket carrier has a drain bore from the 2003 model (see page 6-11). Make sure the bore faces up when mounting.

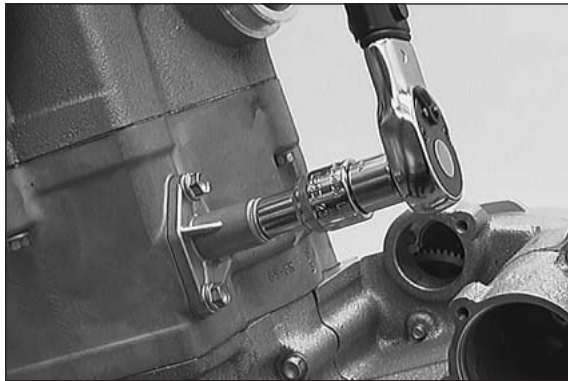
- Remove the assembling sleeve, insert the needle roller in the camshaft and mount the water pump wheel with the Seeger circlip ring.
- Mount the water pump cover with a new gasket. Tighten the bolts (M6x20) crosswise to 8 Nm.



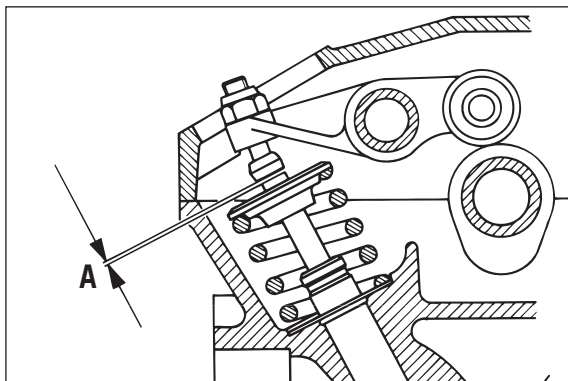


Mounting the timing chain tensioner

- Mount the preassembled timing chain tensioner ❶ with a new gasket.
- Mount the 2 bolts (M6x20) with copper seal rings 6x10x1 and tighten to 10 Nm.



- Use a screwdriver to push the pressure pin in until you feel a slight resistance. Then, push it in one notch further.
- Mount the pressure spring and the plug with a new sealing ring and tighten to 10 Nm.



Adjusting the valve clearance

- The valve clearance ❸ is measured on a cold engine between the valve stem and the adjusting screw.

Valve clearance: 0.12 mm

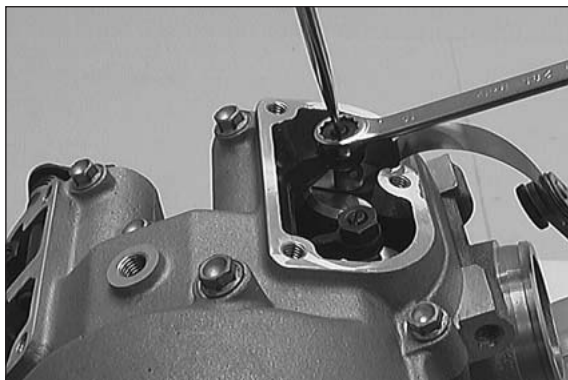
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CAUTION

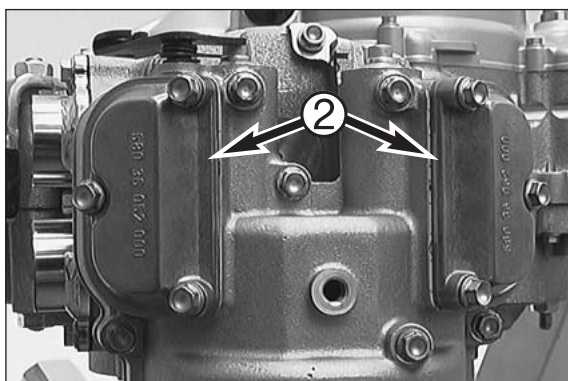
!

IF THE PISTON IS NOT IN THE IGNITION TDC POSITION THE VALVES WILL BE ACTUATED BY THE ROCKER ARMS AND IT WILL NOT BE POSSIBLE TO ADJUST THE VALVE CLEARANCE CORRECTLY. IN THIS CASE THE ENGINE MUST BE TURNED ONE REVOLUTION FURTHER AND BLOCKED AGAIN.

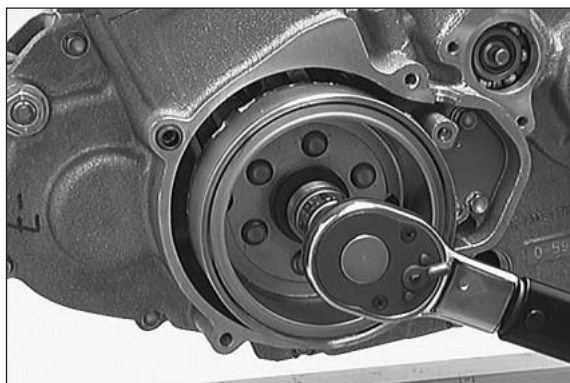
NOTE: The feeler gauge must be pointed and bent slightly to adjust the valve clearance for the 450/525 SX 2003 models.



- Having set the clearance, tighten the counter nuts to 11 Nm and check valve clearance once again.



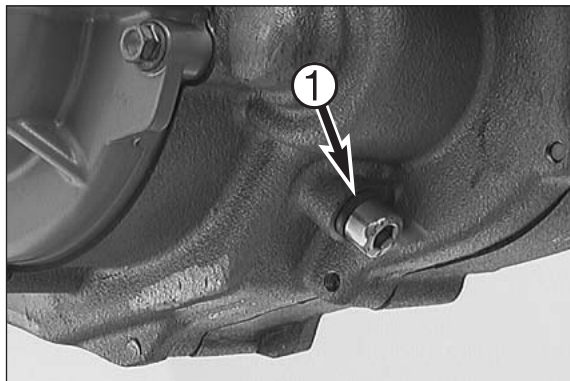
- Mount 2 valve covers ❷ with new gaskets and bolts (M6x20) together with new copper seal rings (6x10x1). Tighten the bolts to 10 Nm.
- Screw in the spark plug and tighten to 12 Nm (M10) or 20 Nm (M12x1.25).



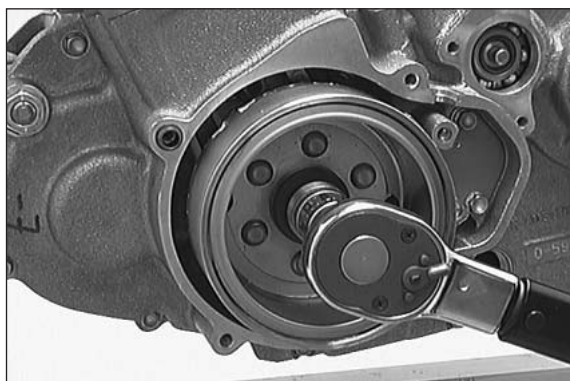
Mounting the flywheel (400/520 models up to 2002)

- Check the Woodruff key in the crankshaft for proper fit and slip the flywheel onto the crankshaft.
- Mount wave washer and collar nut, tighten to 60 Nm.

NOTE: When ordering a new part, a forged rotor will be supplied, this part is produced without rivets and is interchangeable.

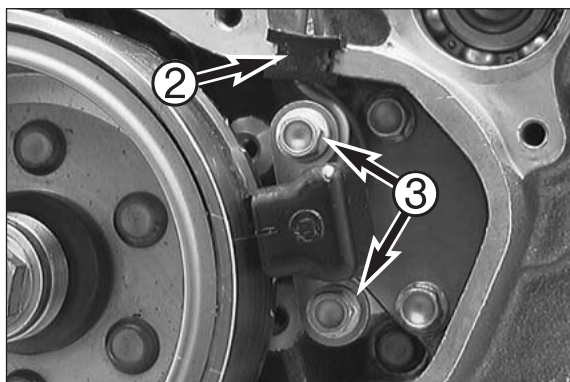


- Unscrew the crankshaft fixing bolt, mount the sealing ring ❶ and tighten the crankshaft fixing bolt again to 25 Nm.



Mounting the flywheel (250 EXC models after 2002, all models after 2003)

- Unscrew the crankshaft fixing screw, mount the seal ring ❶ and tighten the crankshaft fixing screw to 25 Nm (see above).
- Check the Woodruff key in the crankshaft for proper fit and slip the flywheel onto the crankshaft.
- Mount the shaft disk and collar nut. Counteracting with the clutch holder, tighten the and collar nut to 60 Nm.



Mounting the pulse generator and the ignition cover

- Position the pulse generator in the engine casing and insert the cable grommet ❷ into the aperture of the casing.
- Degrease the threads of the 2 bolts ❸ (M5x16), coat them with Loctite 243 and tighten to 6 Nm.

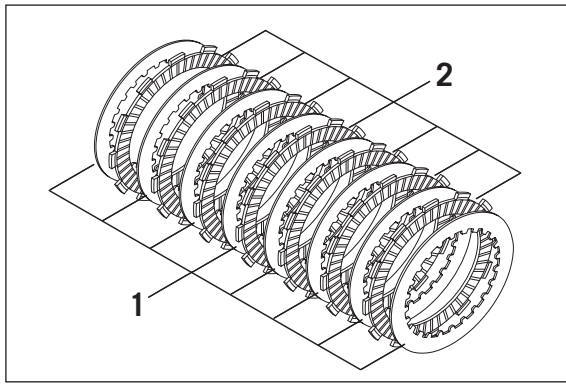
NOTE:

- For the 400 SX engines equipped with the 4K-3A ignition, 2 spacer bushings must be added behind the pulse generator.
- The gap between rotor and pulse generator must be 0.55 - 0.85 mm, but is only adjustable on 400 SX engines (measurement 0.7 mm).



- Apply a new gasket and fix the ignition cover with the 4 bolts (❹ and ❺), tightening torque 10 Nm.

NOTE: The 2 longer bolts ❹ (M6x35) are mounted at the dowels.

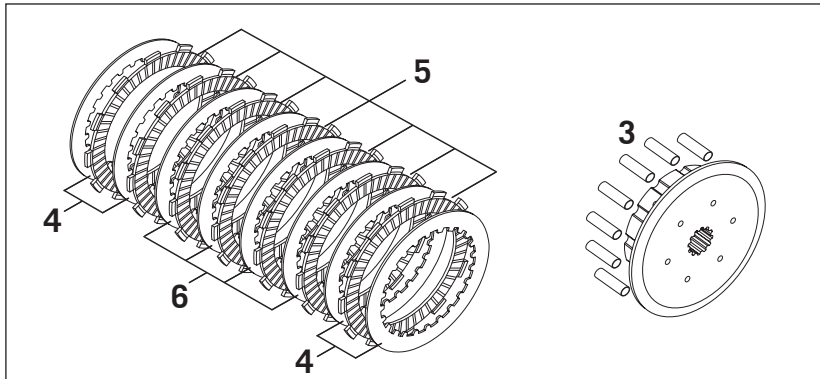


Mounting the clutch

- Prior to assembly, thoroughly oil all lining discs.

Clutch disks up to the 2001 model:

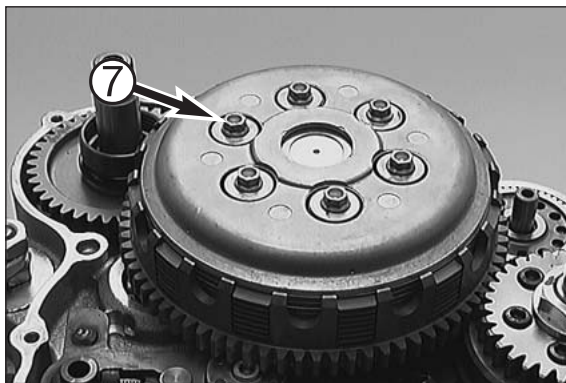
- Starting with an intermediate disc ①, alternately insert a total of 8 intermediate discs and 7 lining discs ②. An intermediate disc must be on top.



Clutch disks from the 2002 model onwards:

- Position the 12 driving pin sleeves ③ on the driver; fix with grease if necessary.
- Starting with a thin clutch disk ④, alternately insert 8 clutch disks and 6 lining disks ⑤, finishing with a thin clutch disk ④ on top.

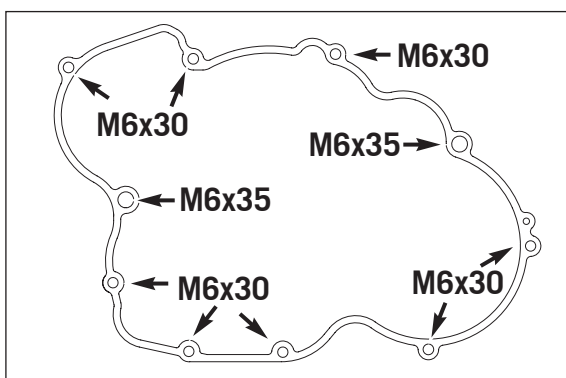
NOTE: The two outer clutch disks ④ are 1 mm thick, the thicker clutch disks ⑥ 1.4 mm are positioned on the inside (see drawing).



- Mounting the pressure piece.
- Apply the pressure cap and mount the clutch springs, the spring retainers, and the collar bolts.
- Apply Loctite 243 to the collar bolts ⑦ and tighten crosswise to 8 Nm.

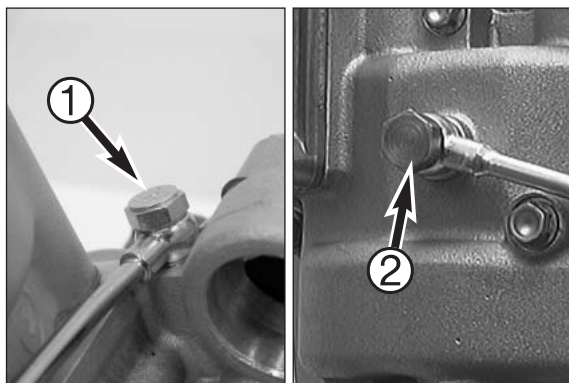


- Verify that the two dowels have been mounted in the engine casing.
- Grease all shaft seal rings in the clutch cover and fix the clutch cover gasket with some grease.
- Pay special attention to ensuring that the gasket does not close off the oil jet ⑨ in the engine casing.
- Fill in app. 30 ml engine oil into the bore of the crankshaft.



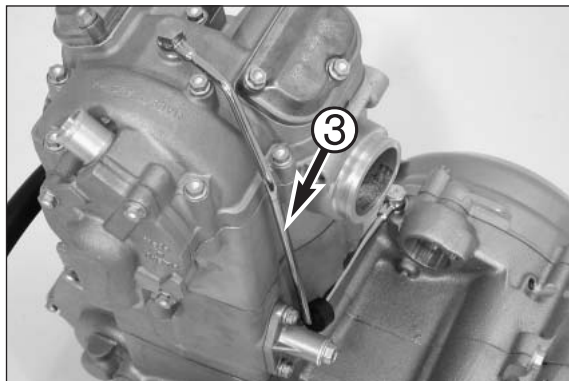
- Carefully mount the preassembled clutch cover and press it on.
- Mount the bolts (bolt lengths M6x30 and M6x35 – see drawing) and tighten them to 10 Nm.

NOTE: If the clutch cover cannot be mounted, check whether the kickstarter spring has been positioned correctly.

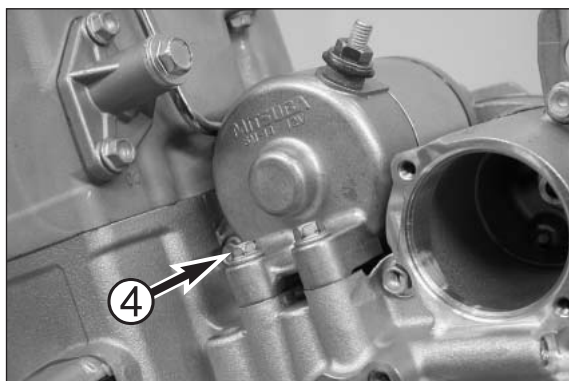


Mounting the oil line

- Position the oil line ③ and secure it with the jet screw ① and the hollow screw ②. Use new sealing rings, tighten the screws to 10 Nm.

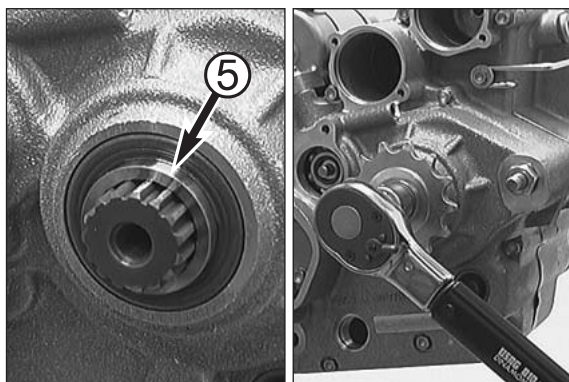


NOTE: Place the oil line such that it does not touch the engine. The oil line must not be twisted during tightening.



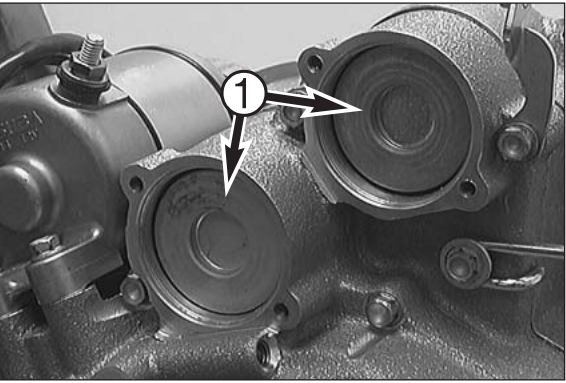
Mounting the electric starter

- Oil the O-ring of the E-starter motor and insert the E-starter motor into the engine casing. Mount the 2 screws ④ (M6x20) and tighten to 8 Nm.



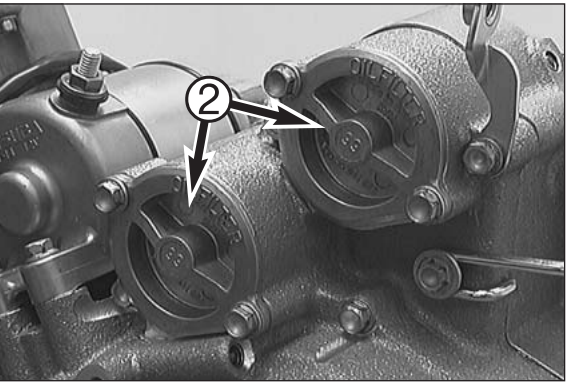
- Oil the spacer bushing ⑤ and slip it onto the countershaft with the recess for the O-ring facing inward.
- Slide the sprocket on with the high collar facing inward.
- Degrease the thread of the collar screw, coat it with Loctite 243 and mount it together with the spring retainer, tighten to 60 Nm.

NOTE: To tighten the screw, shift into 1st gear with the crankshaft being blocked.

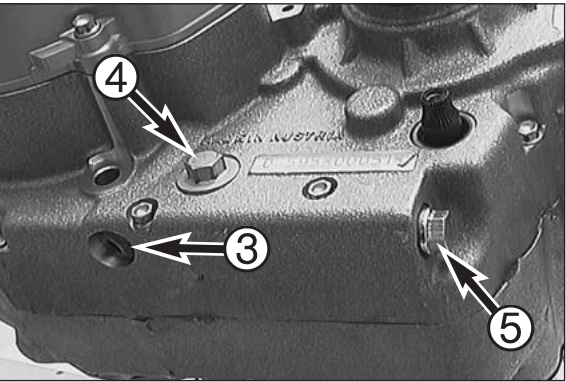


Mounting the oil filters

- Fill the oil filter housing with engine oil to approx. 1/4 of its capacity.
- Insert both oil filters ❶ into the engine casing.



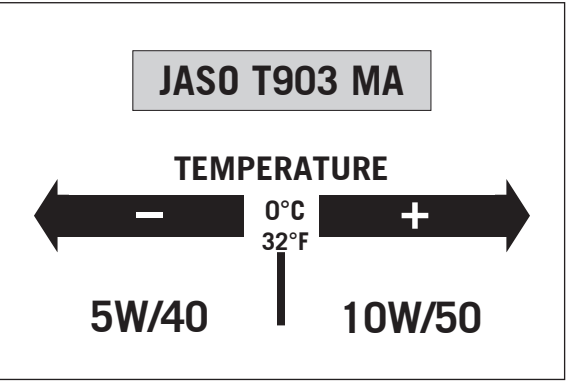
- Oil the O-rings at the oil filter cover and secure the oil filter cover ❷ by means of the 4 bolts (M5x16), tighten to 6 Nm.
- Mount kickstart and shift lever.



How to fill in engine oil

- Mount the plugs ❸ and ❹ and the oil drain plug ❺ and tighten them.

NOTE: Tightening torque ❸ 10 Nm, ❹ 15 Nm and ❺ 20 Nm.



- Remove the oil dipstick at the clutch cover and fill in 1.20 liter of synthetic 10W-50 engine oil (e.g. Motorex Power Synt. 4T).
- Reattach the plug and check the engine for leaks.

NOTE: The engine oil level must be checked once more after the engine has been mounted on the vehicle.

! CAUTION !

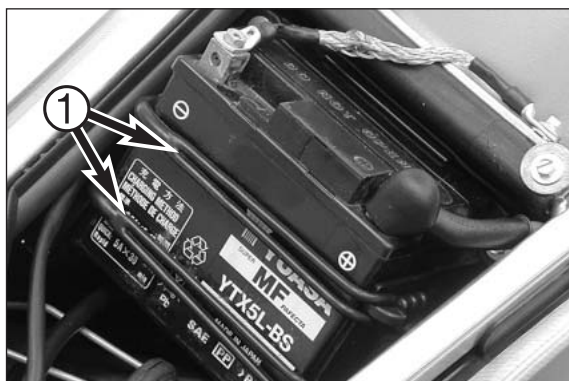
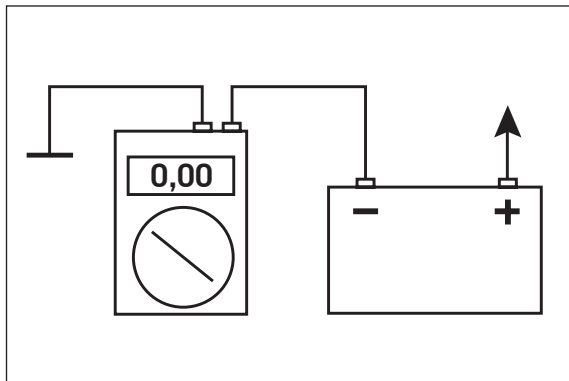
INSUFFICIENT AMOUNTS OR LOW-GRADE ENGINE OIL WILL LEAD TO PREMATURE WEAR IN THE ENGINE.

ELECTRICAL SYSTEM

7

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Leakage inspection

The drop test must be performed before checking the voltage regulator/rectifier

- Turn off the ignition and disconnect the ground wire from the battery.
- Insert an amperemeter between the ground wire and the negative pole of the battery.

Setpoint value: max. 1 mA

- Check for power consumers, should the measured value exceed the indicated maximum value.
Example:
- defective voltage regulator-rectifier
- defective capacitor
- leak currents in the socket connectors, in the ignition lock or in the starter relay.

Removing the battery

- Remove the seat.
- Disconnect first the negative and then the positive pole of the battery.
- Unhitch the two rubber fixtures ❶ and lift the battery out of the battery holder.
- When reinstalling the battery, connect the negative pole last.

! CAUTION

THE BATTERY POLES MUST FACE THE FRONT, OTHERWISE ACID MAY ESCAPE.

Charging the battery

NOTE: A battery charger, item no. 584.29.074.000 is available from KTM.

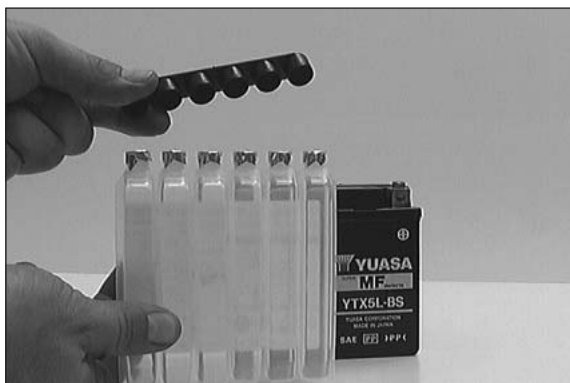
You can also use the battery charger to test the battery's off load voltage, startability and the generator capacity.

- Remove the battery and check the charging level. Use a voltmeter to measure the voltage between the battery poles (off-load voltage).
- Accurate results can only be obtained if the battery has neither been charged nor discharged during a period of 30 minutes preceding the measuring.
- If the battery is empty, it can be recharged for a maximum period of 10 hours at 0.5 A and a maximum of 14.4 V.

! CAUTION

- TO AVOID DAMAGE, DO NOT REMOVE THE LOCKING BAR
- ALWAYS CONNECT THE BATTERY TO THE CHARGING UNIT BEFORE TURNING THE CHARGING UNIT ON.
- WHEN RECHARGING THE BATTERY IN CLOSED ROOMS PROVIDE SUFFICIENT VENTILATION. EXPLOSIVE GASES ARE RELEASED DURING THE BATTERY CHARGING PROCESS.
- CHARGING TIME AND CHARGING VOLTAGE SHOULD NOT EXCEED THE STATED VALUES. OTHERWISE ELECTROLYTE WILL BE RELEASED THROUGH THE SAFETY VALVES.
- AVOID QUICK CHARGING IF POSSIBLE.

off-load voltage Volt	charging level %	charging time 0.5 A	charging voltage
>12.7	100	—	max. 14.4 V
~12.5	75	4 h	
~12.2	50	7 h	
~12.0	25	11 h	
~11.8	0	14 h	



Filling the battery

- Take the battery and the electrolyte container out of the packaging. Before you start filling the battery, please read the enclosed instructions carefully.
- Take the cover off the electrolyte container.
- Apply the electrolyte container to the filling apertures of the battery and push it down tight.



- Once all chambers of the electrolyte container are empty, withdraw it from the battery.



- Close the filling apertures tightly by means of the cover.

NOTE: After filling, let the battery sit for at least another 30 minutes without charging or loading it.

! CAUTION !

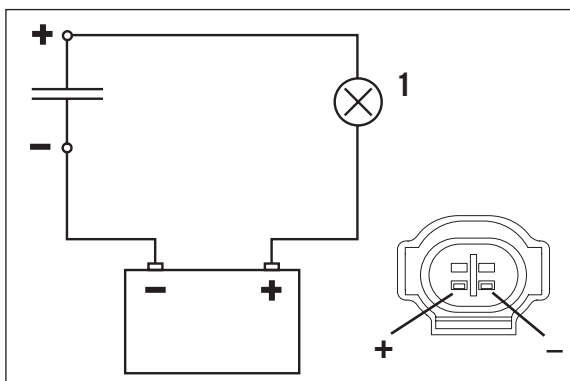
FOLLOW THE INSTRUCTIONS OF THE MANUFACTURER WHEN FILLING A NEW BATTERY.

THE RELEVANT SAFETY INSTRUCTIONS ARE ALSO CONTAINED IN THE USER MANUAL SUPPLIED WITH THE BATTERY. FAILURE TO OBSERVE THESE INSTRUCTIONS CAN RESULT IN SEVERE INJURIES.



Checking the capacitor

- Discharge the capacitor by bridging the two connections with a cable bridge and dismount it.
- Connect the negative pole of a 12V battery with the negative terminal of the capacitor. The connection between the positive pole of the battery and the positive terminal of the capacitor is made with a test lamp ①.
- When the power circuit is closed, the test lamp must light up briefly and return to its dark state after 1 second at the latest.
- If the test lamp does not go out or does not light up at all, the capacitor is faulty.





Checking the voltage regulator-rectifier

A defect voltage regulator can cause different kinds of trouble:

- No voltage in the circuit
In this case, the voltage regulator must be disconnected at idle speed. The voltage regulator is defect if the power consumers now work properly.
If the power consumers are still not supplied with power, the switch, the wiring harness or the ignition system must be checked for defects.
- Excessive voltage in the circuit
The bulbs burn out. In this case the voltage regulator must be replaced.



Checking the charging voltage

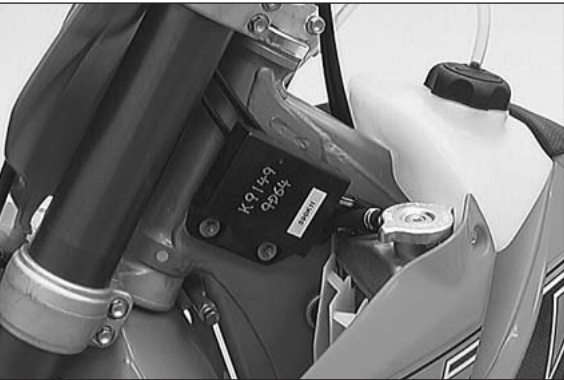
NOTE: The values stated below only apply to fully charged batteries (minimum charging level 90%).

- Start the engine and switch on the low beam.
- Connect a voltmeter to both battery connections.
- Accelerate the engine to a speed of 5000 rpm and read the voltage.

Nominal value: 14.0 - 15.0 V

In the case of a significant deviation from the nominal value:

- Check the connector between the stator and the voltage regulator-rectifier and the connector between the voltage regulator-rectifier and the cable tree.
- Check the stator.
- Replace the voltage regulator-rectifier.



CDI unit

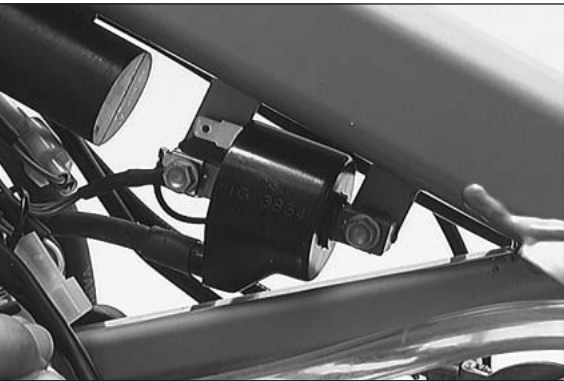
Check the cables and plug and socket connections of the CDI unit.
The CDI unit function can only be checked on an ignition test bench.

!

CAUTION

!

NEVER USE A COMMERCIAL MEASURING DEVICE TO CHECK THE CDI UNIT.
COMMERCIAL MEASURING DEVICES CAN DESTROY HIGHLY SENSITIVE ELECTRONIC COMPONENTS.



Ignition coil

- Disconnect all cables and remove the spark plug connector.
- Use an ohmmeter to measure the following values.

NOTE: The indicated setpoint values correspond to a temperature of 20° C.

Replace the ignition coil if the measured values deviate significantly from the setpoint values.

Measure	Cable colours	Resistance
primary coil	blue/white – ground	0.30 Ω ± 0.05 Ω
secondary coil	blue/white – ignition wire	6.30 kΩ ± 1.25 kΩ

Troubleshooting in the ignition system

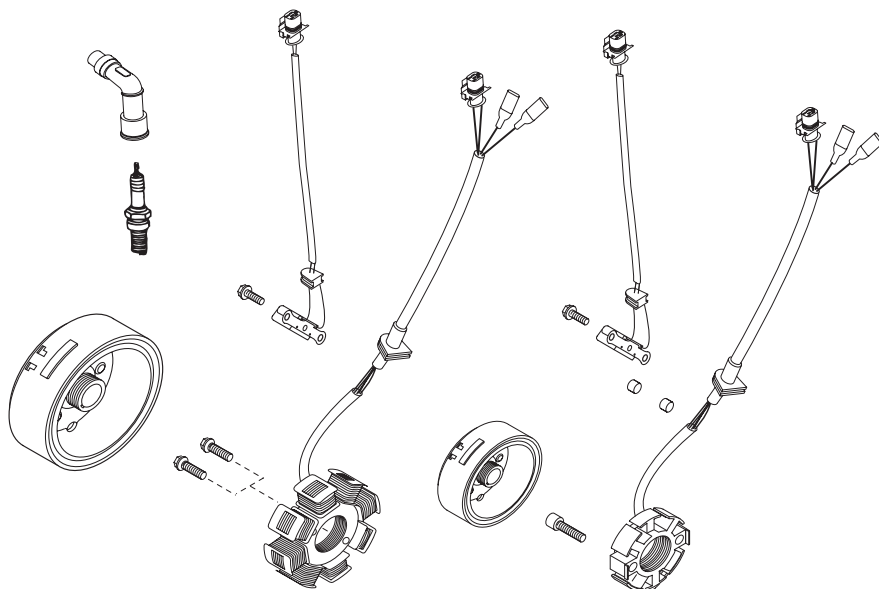
Before checking the ignition system check:

- if the emergency off switch is switched on
- if the battery is charged
- the main fuse

Check if an ignition spark is produced when the starter is operated. Proceed as follows:

- Pull off the spark plug connector.
- Disconnect the spark plug connector from the ignition cable.
- Hold the free end of the ignition cable approximately 5 mm (0.1968 in) from the ground.
- A strong spark should be visible when the electric starter is operated. If the battery level is low, turn off the light, and use the kick starter.
- If a spark is visible, replace the spark plug connector.
- Twist out the spark plug and insert it into the spark plug connector.
- Connect the spark plug to the ground. A strong spark should be visible at the electrode when the electric starter is operated. If this is not the case, the spark plug connector or the spark plug is defective.
- If no spark is produced during the first test, perform the following checks:
 - emergency off switch and
 - corresponding parts of the cable tree
- If the ignition is sufficiently supplied with power and no spark is produced, check:
 - the ground connection of CDI unit and ignition coil
 - the cable between the CDI unit and the ignition coil
 - the pulse generator
 - the stator
 - the ignition coil
 - the short circuit button

NOTE: The CDI unit cannot be tested with simple devices. It can only be replaced. It can only be tested on an ignition test bench.



Ignition

General information

The measurements described below will only reveal severe problems. Coil short circuits leading to weak ignition sparks or low generator output, respectively, can only be detected with the help of an ignition test bench. In the case of malfunction always check the cables and the plug and socket connections of the ignition system first.

Make sure to select the correct measuring range when performing measurements.

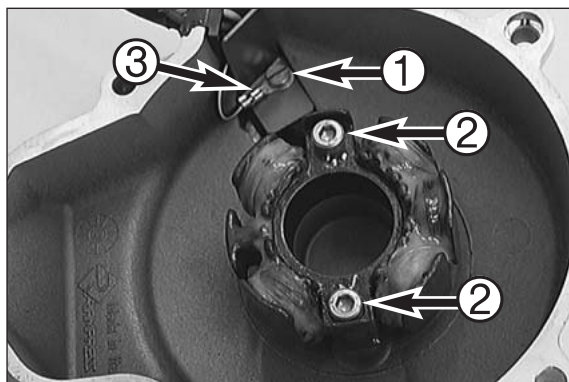
Ignition	Measure	cable colours	Resistance
4K-3A	Pulser coil	red – green	$100 \Omega \pm 20 \Omega$
	Exciter	black/red – red/white	$26 \Omega \pm 5.2 \Omega$
	Charge coil	ground – yellow	$0.74 \Omega \pm 0.15 \Omega$
4K-3B	Pulser coil	red – green	$100 \Omega \pm 20 \Omega$
	Exciter	black/red – red/white	$15 \Omega \pm 3 \Omega$
	Charge coil	ground – yellow	$0.65 \Omega \pm 0.15 \Omega$
		white – yellow	$0.16 \Omega \pm 0.03 \Omega$

Check stator and pulse generator

Use an ohmmeter to perform the following measurements:

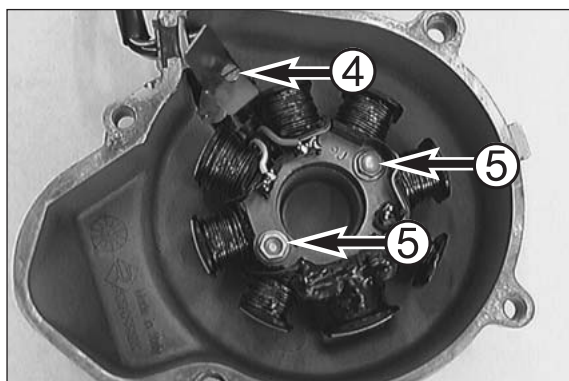
NOTE:

- The measuring must be performed at a temperature of 20°C . Otherwise significant deviations must be expected. Replace the stator and/or the pulse generator if the measured values deviate significantly from the setpoint values.
- The 4K3A ignition system no longer has a charging coil from the 2004 model.



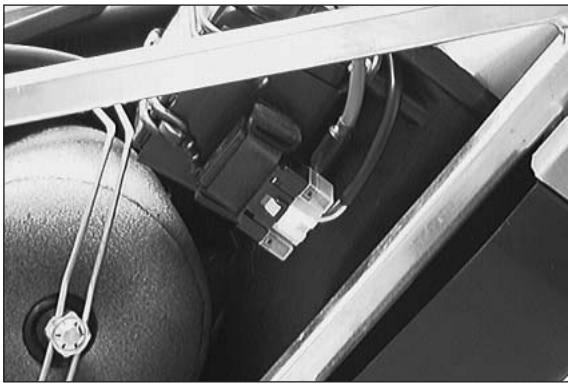
Replacing the stator 4K-3A

- Remove the bolt ❶ and dismount the retaining plate.
- Remove the 2 bolts ❷ and take the stator out from the ignition cover.
- Place a new stator in the ignition cover. Degrease the threads of all 3 bolts and apply Loctite 243.
- Mount the bolts and tighten them to 6 Nm.
- Place the wire harness in a non-energized condition and secure it with the retaining plate. Do not forget the cable socket ❸.



Replacing the stator 4K-3B

- Remove the bolt ❹ and dismount the retaining plate.
- Remove the 2 bolts ❺ and take the stator out from the ignition cover.
- Place a new stator in the ignition cover. Degrease the threads of all 3 bolts and apply Loctite 243.
- Mount the bolts and tighten them to 10 Nm.
- Place the wire harness in a non-energized condition and secure it with the retaining plate.



Main fuse

NOTE: The fuse ❶ (10A) is positioned in the starter relay of the E-starter underneath the left side paneling.

The following loads are connected to it:

- E-starter system
- horn
- flasher lights

The fuse ❷ serves as a spare fuse.

- To replace it, remove the left trim panel and pull the cover off the start relay.
- Pull out the fuse and replace it with a new one.

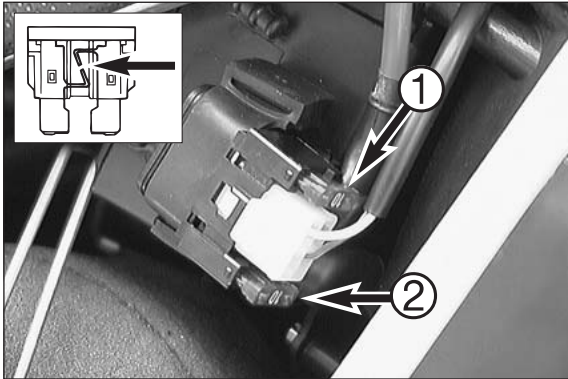
!

CAUTION

!

NEVER INSERT A STRONGER FUSE OR "MEND" THE FUSE. IMPROPER HANDLING MAY DESTROY THE ENTIRE ELECTRIC SYSTEM!

NOTE: In case you use the spare fuse to replace the installed one while using your motorcycle, you should remember to replace it as soon as possible.



Checking the electric starter motor

- Disconnect the negative pole of the battery and remove the electric starter motor.
- Connect the negative pole of a 12 V battery to the housing of the E-starter motor and briefly connect the positive pole of the battery to connection ❸ of the electric starter motor (use thick cables).
- The starter must turn as soon as the circuit is closed.
- If this is not the case, replace the starter motor.



Checking the starter relay

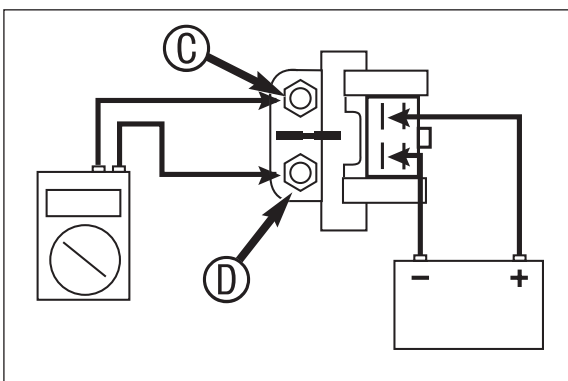
- Remove the seat and the left side cover and disconnect the combination connector of the starter relay.
- Disconnect the negative terminal at the battery and the two cables at the starter relay.

- Connect the starter relay to a 12 V battery as indicated in the diagram.
- Check continuity between terminals ❸ and ❹ using an ohmmeter.

Reading: 0 Ω OK

Reading: ∞ Ω defective

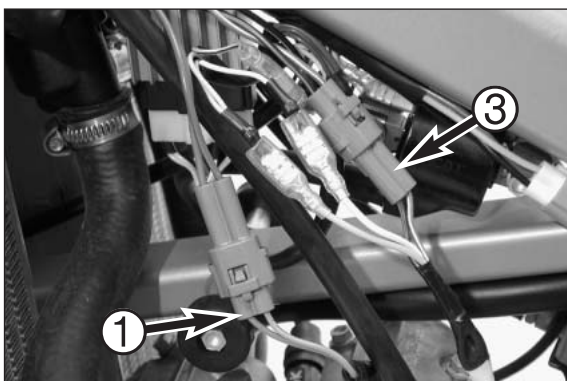
NOTE: The response of the starter relay is accompanied by a faint clicking sound.



STATIC IGNITION VALUES KOKUSAN 4K-3A, B

Measuring conditions:

- cold engine
- seat and tank removed
- all connectors and the ground connection in a non-corroding condition, connectors tightly connected
- battery loaded (if installed) and light switch turned off
- the gap between the rotor and pulse generator must be set to 0.75 mm
- compression release lever pulled
- kick the kick starter forcefully at least 5 times for each measurement



Check the **pulse generator** for an output signal – two-pin connector ① with green and red cable colors (also see circuit diagram on next page):

- Apply the red measuring lead of the peak voltage adapter 584.29.042.000 to the green cable and the black measuring lead to the red cable, disconnect connector ① to disconnect the CDI unit ②

Multimeter display: 4.5 volts +/- 0.5 volt

- Same measurement with CDI unit connected

Multimeter display: 3 volts +/- 0.5 volt

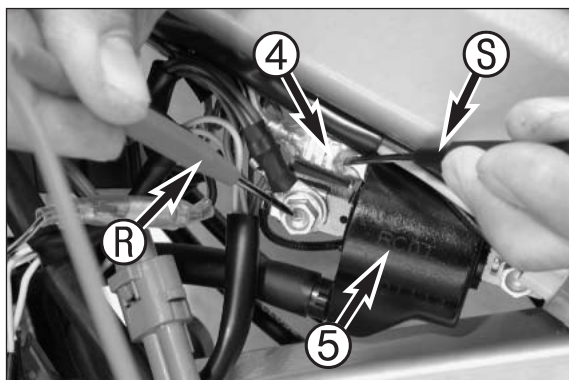
Check the **generator charging coil** for ignition capacitor charge – two-pin connector ③ with black/red and red/white cable colors (also see circuit diagram on next page):

- Apply the red measuring lead of the peak voltage adapter to the black/red cable and the black measuring lead to the red/white cable, disconnect connector ③ to disconnect the CDI unit ②

Multimeter display: 30 volts (35 volts for 400 SX) +/- 5 volts

- Same measurement with connectors CDI unit connected

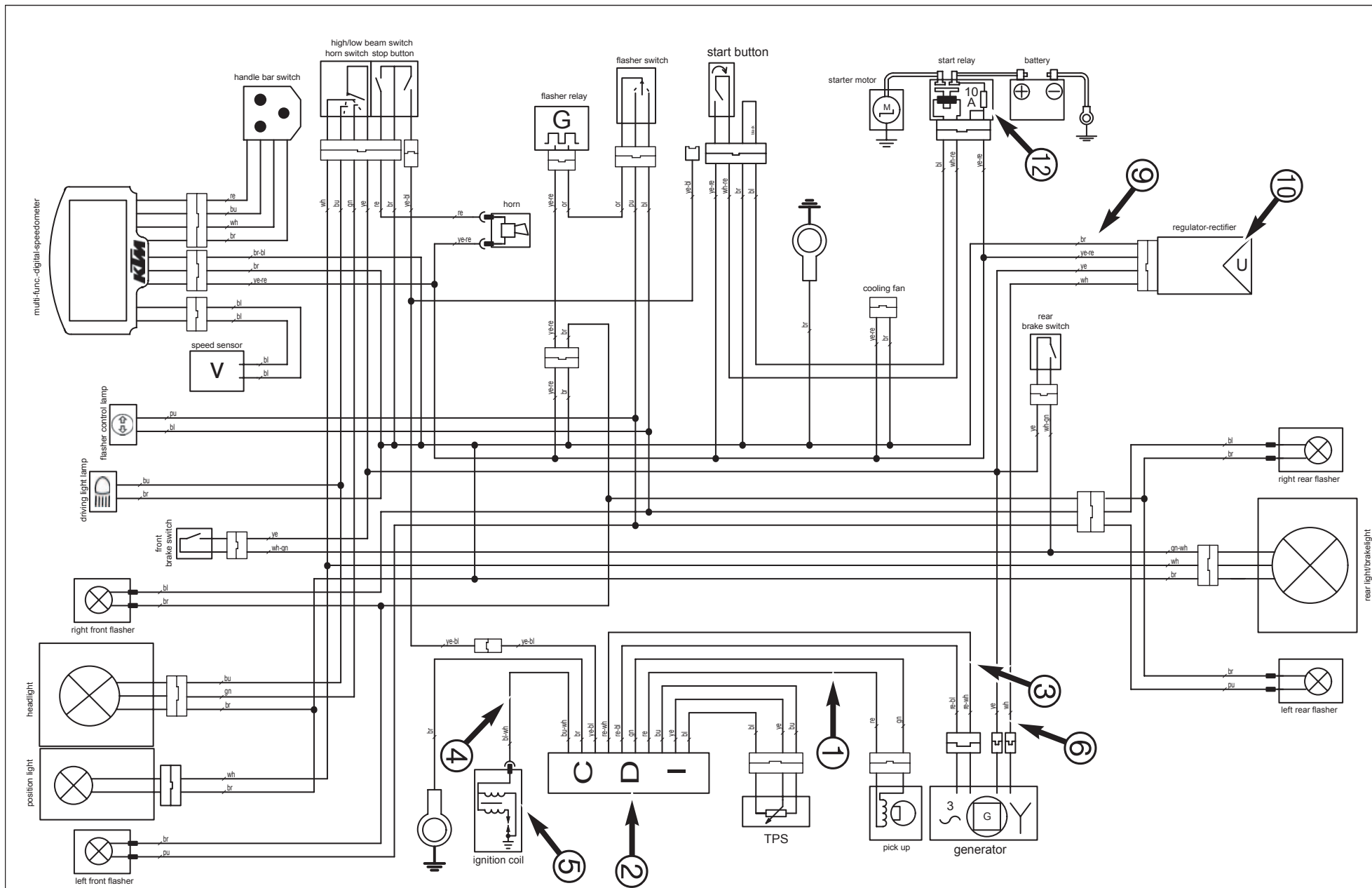
Multimeter display: 200 volts +/- 10 volts



Check the **primary voltage output** ④ for ignition coil control (also see circuit diagram on opposite page) for output voltage (blue/white cable color):

- Apply the red measuring lead ⑥ of the peak voltage adapter to the black/white cable (ground) and the black measuring lead ⑦ to the blue/white cable, CDI unit ② and ignition coil ⑤ connected

Multimeter display: 200 volts +/- 10 volts



EXC Racing 2004
250,450,525

wiring diagramm

main harness

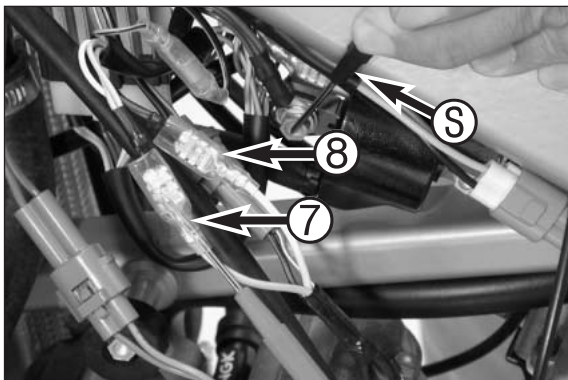
590.11.075.550

22.05.2003

STATIC GENERATOR VALUES KOKUSAN 4K-3B

Measuring conditions:

- cold engine
- seat and tank removed
- all connectors and the ground connection in a non-corroding condition, connectors tightly connected
- battery loaded (if installed) and light switch turned off
- compression release lever pulled
- kick the kick starter forcefully at least 5 times for each measurement



Check the **generator output ⑥** (also see circuit diagram on opposite page) for voltage between the following cable colors:

- between yellow and brown (ground), connector ⑦ disconnected
Multimeter display: 15 volts +/- 1 volt

- same measurement with connector ⑦ connected

Multimeter display: 12 volts +/- 1 volt

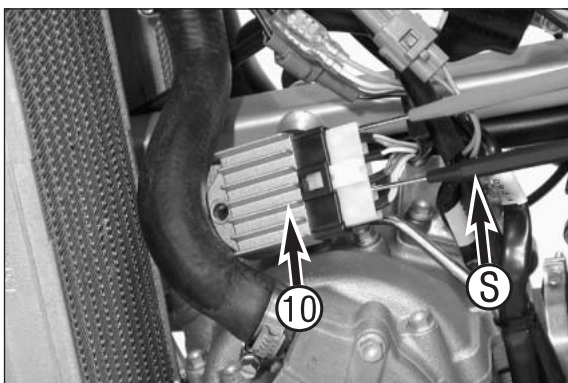
- between white and brown (ground), connector ⑧ disconnected

Multimeter display: 19 volts +/- 1 volt

- same measurement with connector ⑧ connected

Multimeter display: 14 volts +/- 1 volt

NOTE: The black measuring lead ⑧ of the peak voltage adapter must be applied to the ground.



Check **regulator rectifier output voltage ⑨** (also see circuit diagram on opposite page) cable colors yellow/red, regulator rectifier ⑩ connected, capacitor disconnected (if installed) and fuse ⑫ removed:

- between yellow/red and brown (ground)

Multimeter display: 14 volts +/- 1 volt

NOTE:

- The black measuring lead ⑨ of the peak voltage adapter must be applied to the ground.
- For facilitation of work, the regulator rectifier ⑩ can be detached from the frame.

DYNAMIC GENERATOR VALUES KOKUSAN 4K-3B

Measuring conditions:

- remove seat, side trim and left side cover
- all connectors and the ground connection in a non-corroding condition, connectors tightly connected
- battery in a startable condition, not fully loaded (start several times for fully loaded battery)
- start engine, the measurement must be taken right after starting



Regulator rectifier output – measure the voltage with the measuring leads of the peak voltage adapter 584.29.042.000 directly on the poles of the vehicle battery:

- Unstressed (no electric consumer switched on), engine running at idle speed (1400 +/- 50 rpm)

Multimeter display: 14 volts +/- 1 volt

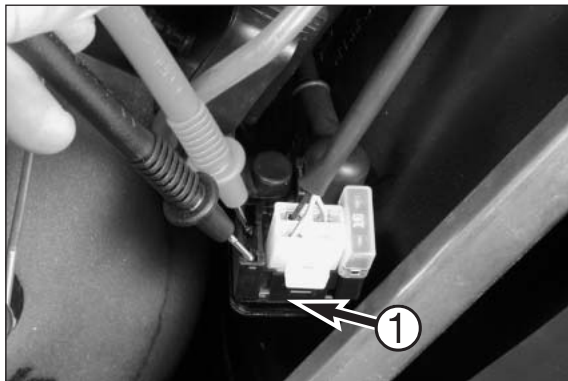
- Stressed (light switched on, horn and brake actuated), engine running at idle speed

Multimeter display: 12 volts +/- 1 volt

- Stressed (light switched on, horn and brake actuated), engine running at increasing speed (up to 8000 rpm)

Multimeter display: 13 volts +/- 1 volt

NOTE: The black measuring lead on the peak voltage adapter should be applied to the ground (negative terminal).



Check the **charge current** – remove main fuse, apply the multimeter measuring leads (without the peak voltage adapter) to both connectors on the fuse carrier ❶ and measure the current (set the multimeter DCA to 10 amperes):

- Unstressed (no electric consumer switched on), engine running at idle speed

Multimeter display: 1.3 amperes +/- 0.1 ampere

- Stressed (light switched on, horn and brake actuated), engine running at idle speed

Multimeter display: -0.6 amperes +/- 0.1 ampere

- Stressed (light switched on, horn and brake actuated), engine running at increasing speed

Multimeter display: 0.0 amperes +/- 0.1 ampere

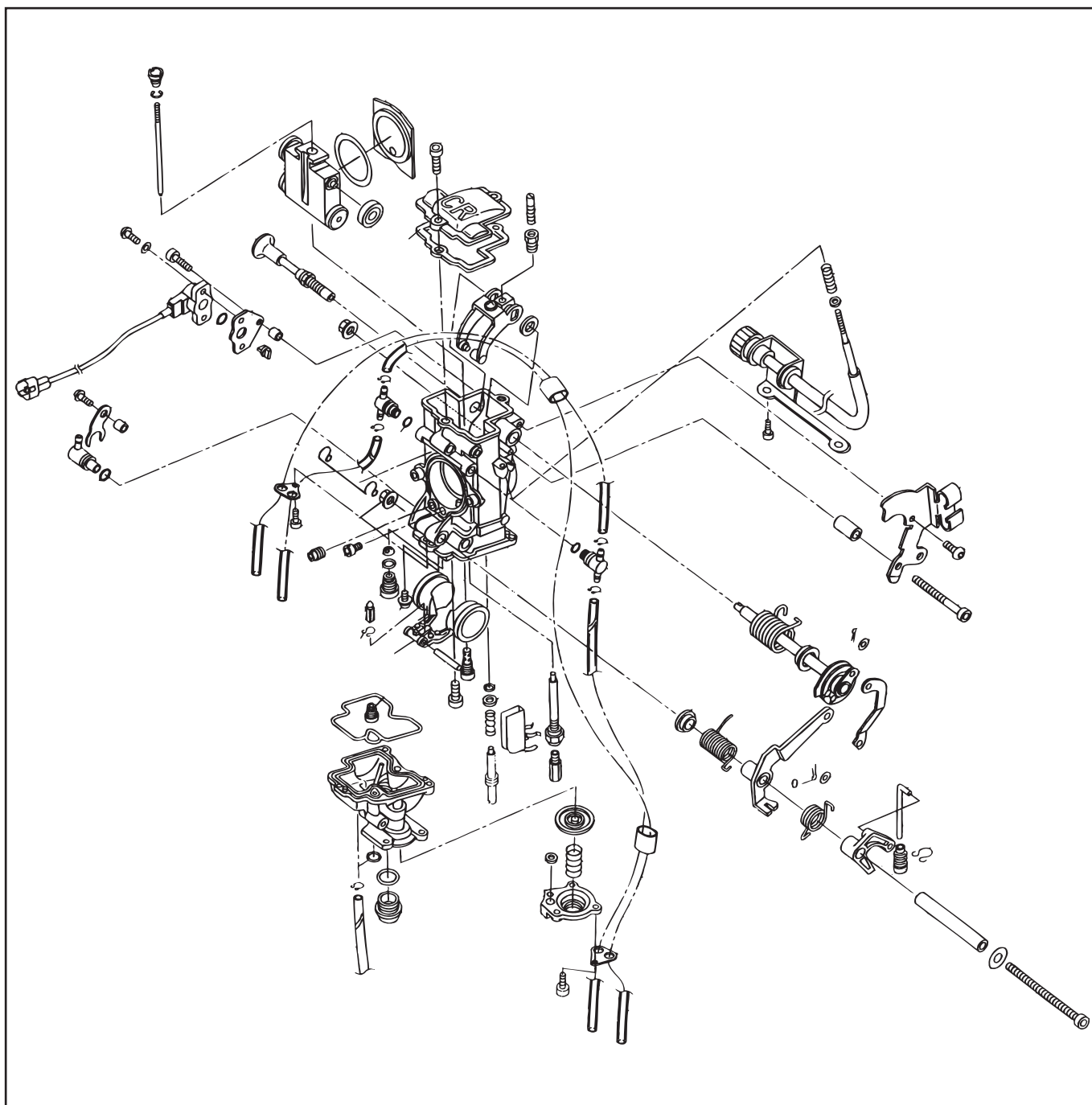
FUEL SYSTEM

8

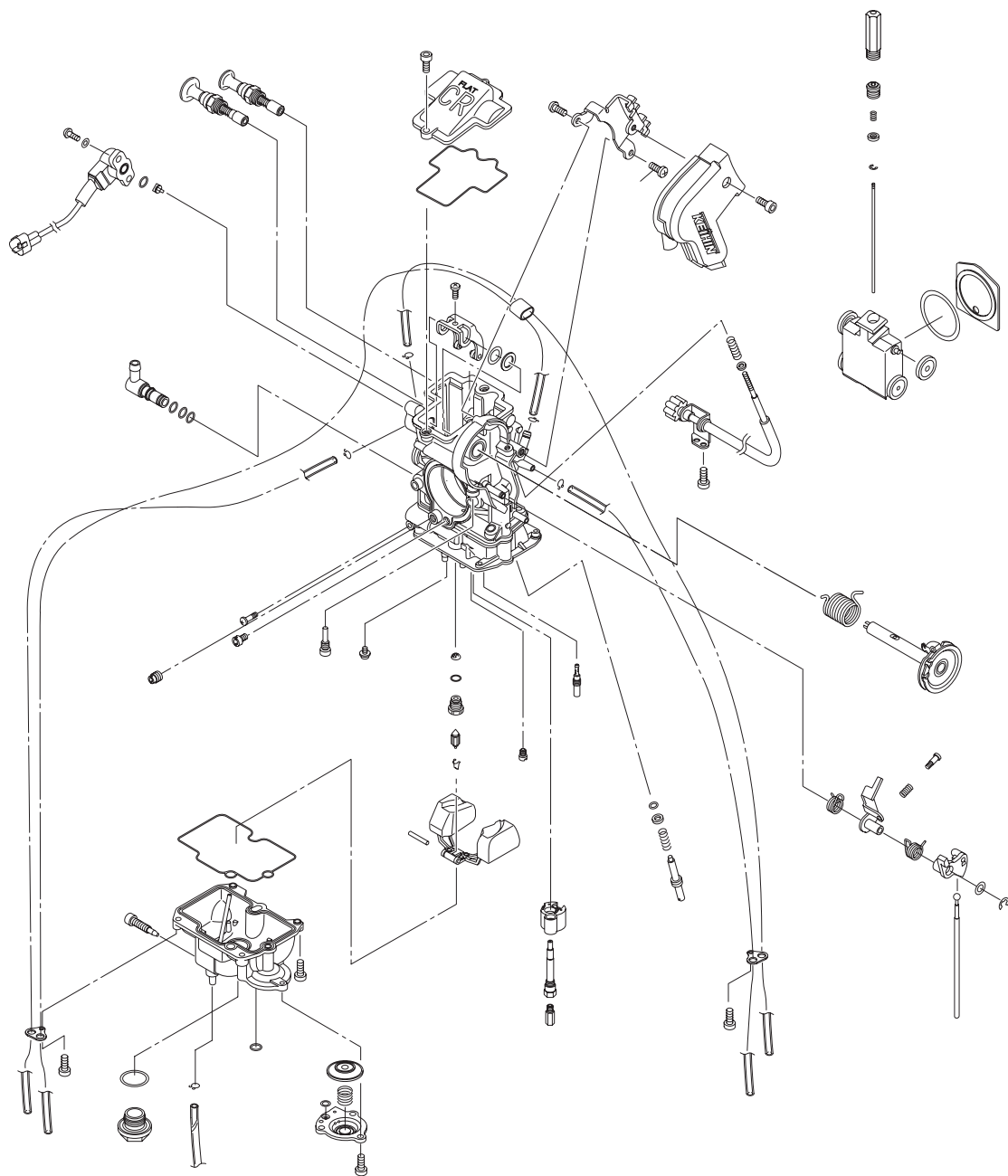
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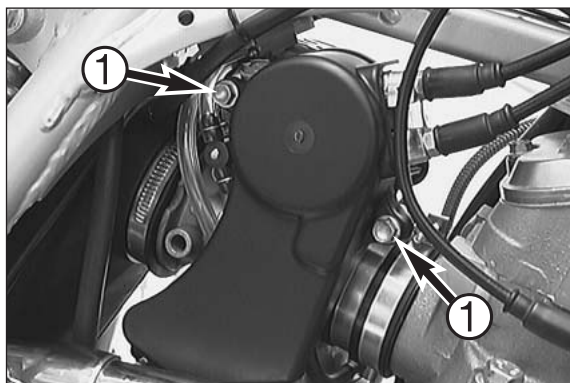
DISMOUNTING AND INSTALLING THE CARBURETOR	8-4
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CHECKING/ADJUSTING THE FLOAT HEIGHT	8-21

CARBURETOR - KEIHIN FCR 35 / 39



NOTE: The Keihin FCR 39 carburetor (400/520 Racing) has a larger air trumpet and a different carburetor jets than the Keihin 35 carburetor (250 Racing). The FCR 39 carburetor is also equipped with a throttle sensor.

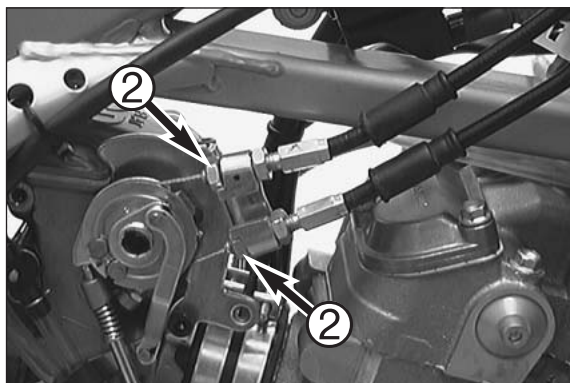
CARBURETOR - KEIHIN FCR-MX 37 / 39 / 41



Dismounting and installing the carburetor

NOTE: Before you start working on the carburetor, you should clean the motorcycle thoroughly.

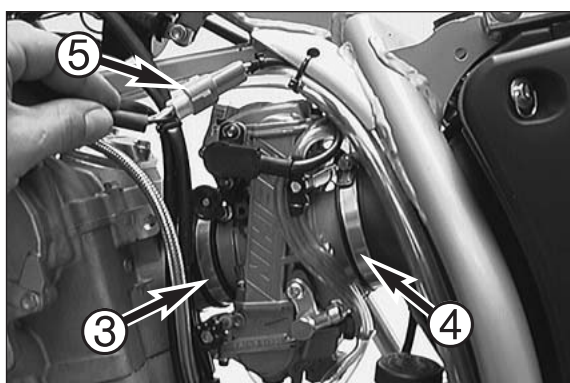
- Dismount the seat and the tank with spoilers.
- Unfasten the 2 bolts ❶ and remove the cover.



- Unfasten the 2 nuts ❷ and unhitch both throttle cables at the carburetor.
- Loosen the plug at the float chamber and drain the fuel into a suitable receptacle. Then, retighten the plug.
- Disconnect the plug-and-socket connection of the throttle valve sensor.



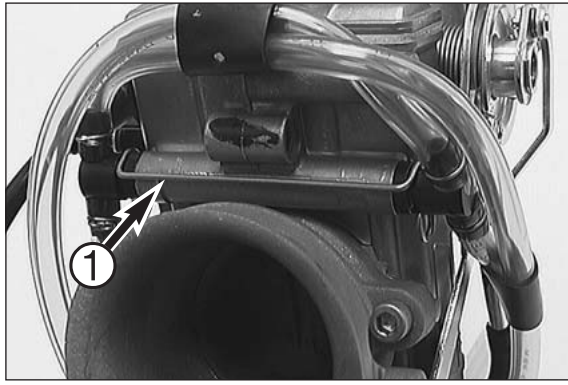
- Loosen the 2 hose clamps ❸ + ❹ and pull the carburetor out of the connection boot.



- To install the carburetor, insert it into the connection boot and secure it with the 2 hose clamps. Make sure that the carburetor is installed vertically in relation to the vehicle.
- Mount and adjust both throttle cables and check whether the throttle grip moves smoothly.
- Connect the plug ❺ of the throttle-valve sensor.
- Mount the tank and the seat.



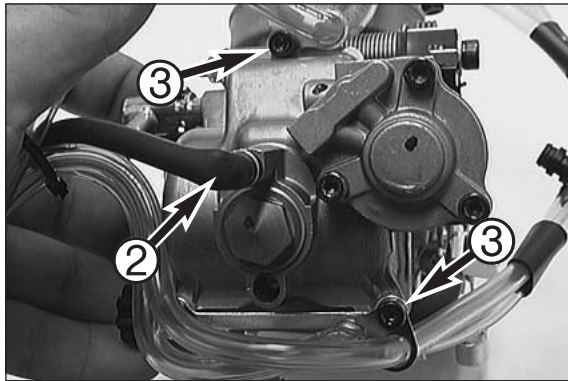
- Place the carburetor ventilation hoses correctly.
- Start the engine and check the carburetor for proper functioning. Turn the handlebars all the way to the left and right. While doing so, the engine speed must not change. Otherwise, check if the throttle cables were placed correctly.



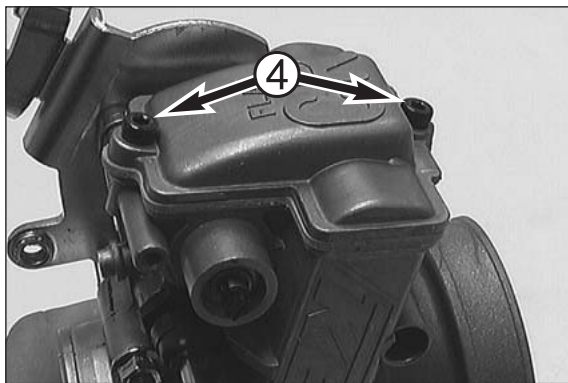
Disassembling the carburetor FCR 35/39

NOTE: Before you start disassembling the carburetor, you should look for a clean workplace. It should offer you enough space to lay out all individual components of the carburetor in perfect order.

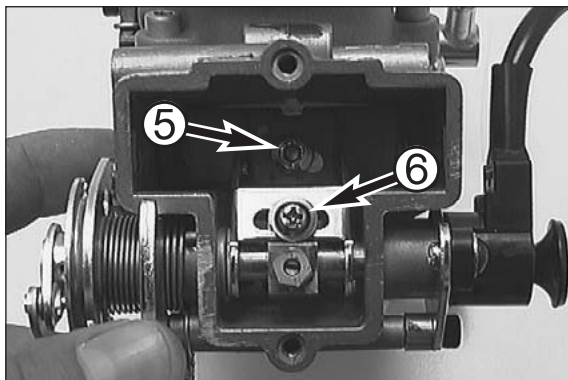
- Dismount the carburetor and remove any coarse dirt.



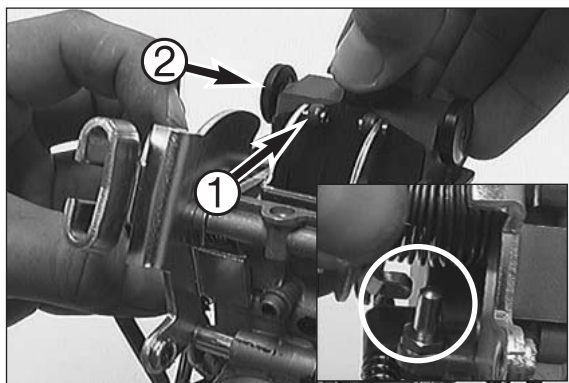
- Remove the wire clip ① and pull the ventilation hoses out of the carburetor.
- Disconnect the hose ②.
- Loosen the 2 bolts ③ and dismount all ventilation hoses from the carburetor.



- Remove the 2 bolts ④ and dismount the slide cover together with its gasket.

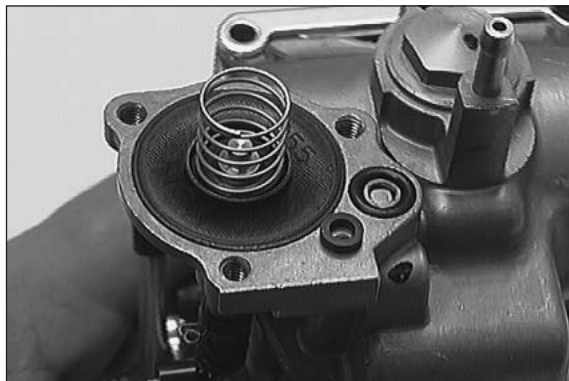


- Remove the bolt ⑤ and take the jet needle out of the throttle valve.
- Remove the bolt ⑥.



- Now, pull the cable disc approx. 5 mm outward and turn it until the throttle valve can be lifted out of the carburetor and detach the rollers ① at the throttle valve.
- Take the throttle valve together with the 4 rollers ② and the valve paddle out of the carburetor.

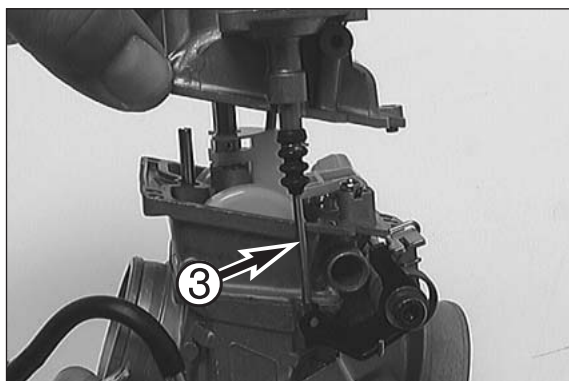
NOTE: When you turn the cable disc, it must not be blocked by the stop screw (see photo). Otherwise, pull the shaft further outward.



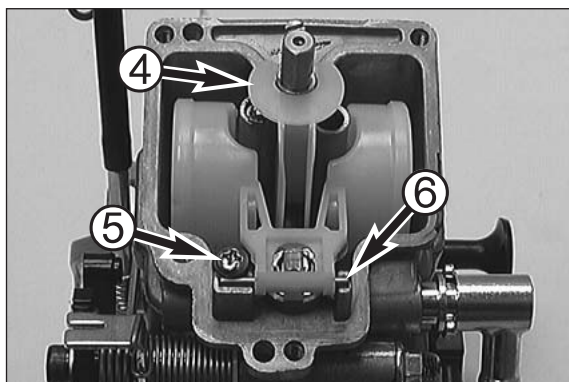
- Turn the carburetor around, remove the 3 screws and remove the cover of the accelerator pump.

NOTE: When dismantling the cover, watch out for the spring and the sealing rings as they may get lost easily.

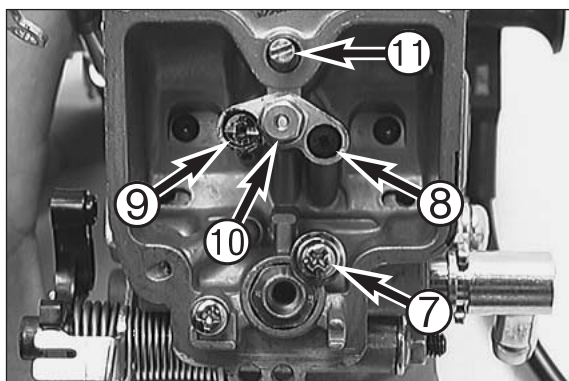
- Remove the 2 sealing rings, the spring and the diaphragm from the pump housing.



- Remove the screw and dismount the float chamber.
- Unhitch the push rod ③ of the accelerator pump and dismount it.

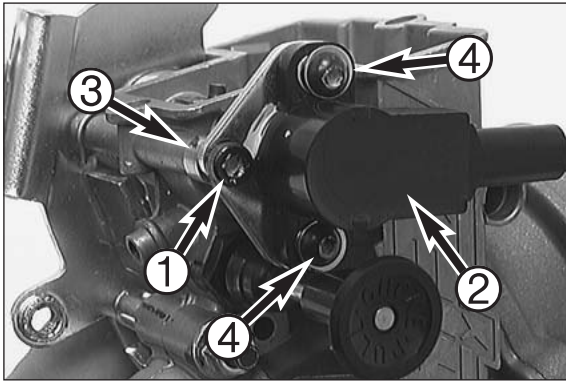


- Take the plastic part ④ off the needle jet.
- Loosen the screw ⑤, pull out the float hinge pin ⑥ and dismount the float together with the float needle valve.



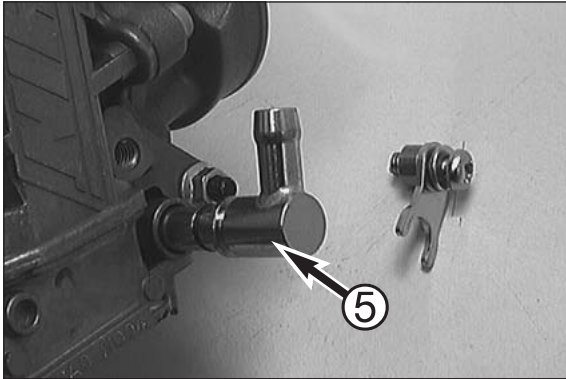
- Remove the screw ⑦ and use pliers to carefully extract the seat of the float needle valve from the carburetor.
- Turn out the idling jet ⑧, the starting jet ⑨ and the needle jet together with the main jet ⑩.
- Turn in the mixture control screw ⑪ down to the stop, count the number of turns and write it down.
- Turn out the mixture control screw and dismount it together with the spring, the washer, and the O-ring.

NOTE: The spring, the washer, and the O-ring will usually remain in the bore. These parts can be removed with the help of compressed air.

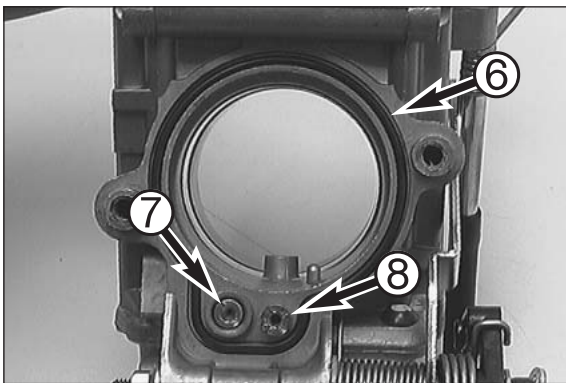


- Remove the screw ① and dismount the throttle-valve sensor ②. When unfastening the screw, be sure to watch out for the bushing ③.

NOTE: To dismount the throttle-valve sensor, always remove the screw ①. After the screws ④ were loosened, the throttle-valve sensor must be adjusted again.



- Remove the screw and the clip together with the bushing and pull the connection piece ⑤ out of the carburetor.

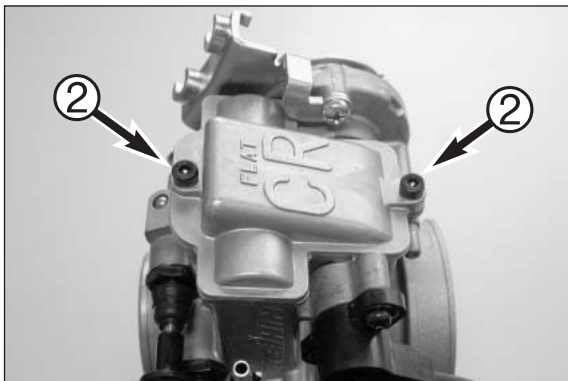
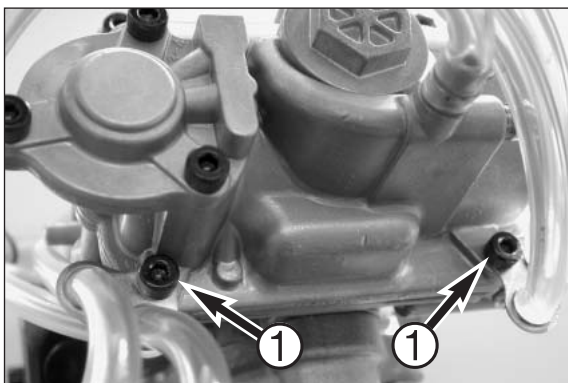


- Remove the 2 screws and take the intake trumpet together with the O-ring ⑥ off the carburetor.
- Unscrew the idle-air jet ⑦ and the main air jet ⑧.
- Thoroughly clean all jets and other parts and blow compressed air through them.
- Clean the carburetor housing and blow compressed air through all the ducts in the carburetor.
- Check all gaskets for damage and, if necessary, replace them.

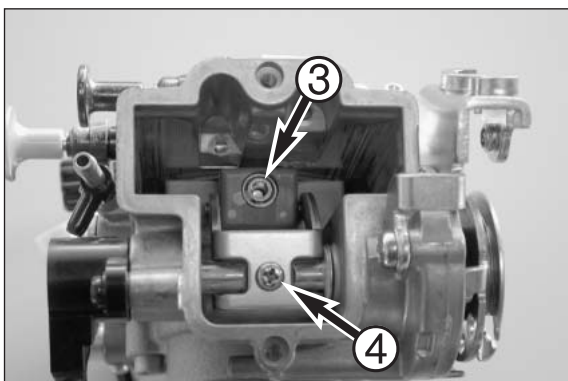
Disassembling the carburetor Keihin FCR - MX 37/39/41

NOTE: Before you start disassembling the carburetor, you should look for a clean workplace. It should offer you enough space to lay out all individual components of the carburetor in perfect order.

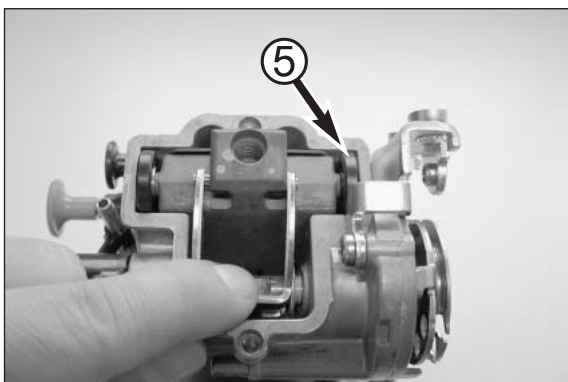
- Dismount the carburetor and remove any coarse dirt.
- Loosen both screws ❶ and remove all of the vent hoses from the carburetor.
- Remove both screws ❷ and remove the slide cover and gasket from the carburetor.



- Remove screw ❸ and pull the jet needle out of the throttle slide.
- Remove screw ❹.



- Pull the throttle slide arm up and take the throttle slide roller ❺ and the slide shim out of the carburetor.





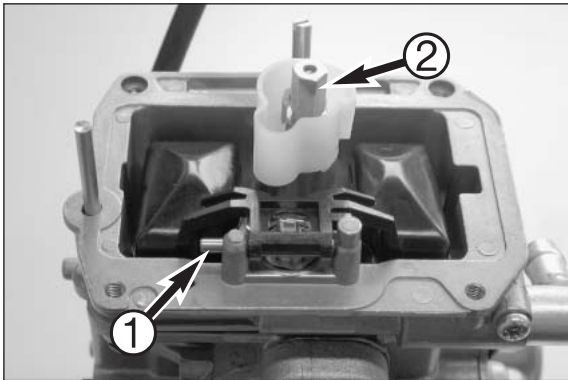
- Turn the carburetor around, remove the 3 screws and remove the cover of the accelerator pump.

NOTE: When dismantling the cover, watch out for the spring and the sealing rings as they may get lost easily.

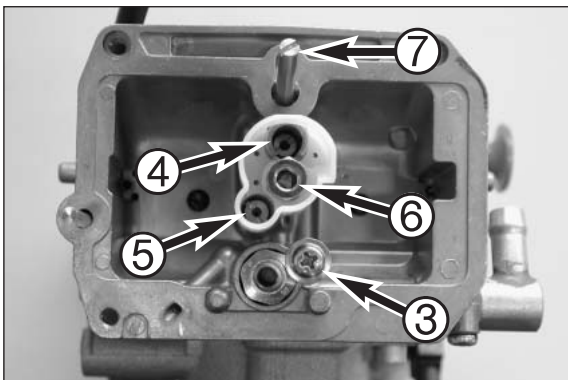
- Remove the 2 sealing rings, the spring and the diaphragm from the pump housing.



- Remove the screws on the float chamber and remove the housing.

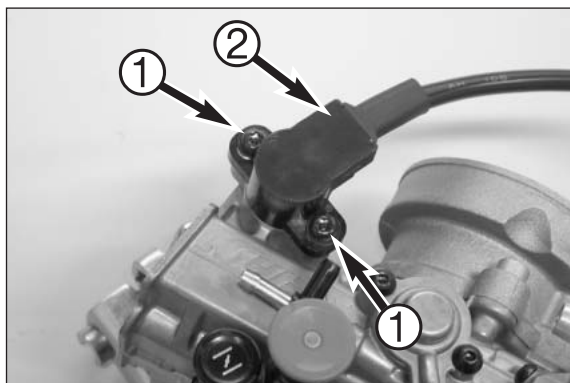


- Pull out the float hinge pin ① and remove the float together with the float needle valve.
- Remove the main jet ②.



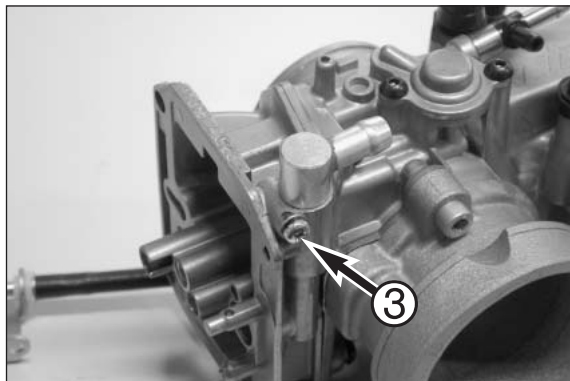
- Remove the screw ③ and use pliers to carefully extract the seat of the float needle valve from the carburetor.
- Screw out the idling jet ④, the starting jet ⑤ and the needle jet ⑥.
- Turn in the mixture control screw ⑦ down to the stop, count the number of turns and write it down.
- Turn out the mixture control screw and dismount it together with the spring, the washer, and the O-ring.

NOTE: The spring, the washer, and the O-ring will usually remain in the bore. These parts can be removed with the help of compressed air.

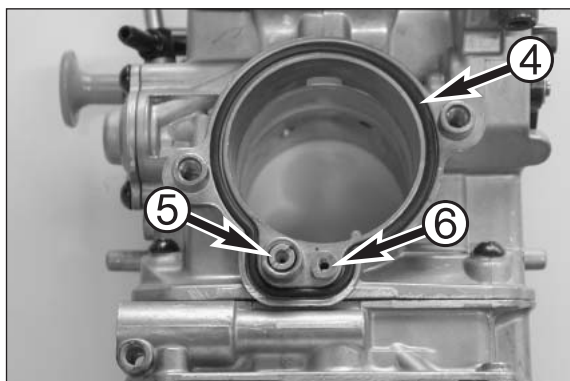


- Remove screws ① and the throttle sensor ②.

NOTE: the throttle sensor should only be dismantled if defective. If the screws ① are loosened, the throttle sensor must be adjusted again.



- Remove screw ③ and pull the connecting piece out of the carburetor.



- Remove the 2 screws and take the intake trumpet together with the O-ring ④ off the carburetor.
- Unscrew the idle-air jet ⑤ and the main air jet ⑥.
- Thoroughly clean all jets and other parts and blow compressed air through them.
- Clean the carburetor housing and blow compressed air through all the ducts in the carburetor.
- Check all gaskets for damage and, if necessary, replace them.



Checking the choke slide and hot start knob

Choke slide:

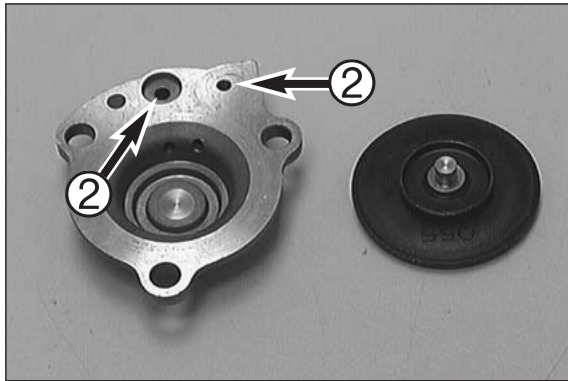
The choke slide must be easy to actuate .

The piston ❶ of the choke slide must not have any pronounced score marks or deposits.

Hot start knob:

The hot start knob must be easily actuated.

The piston on the hot start knob may not have any scores or deposits.

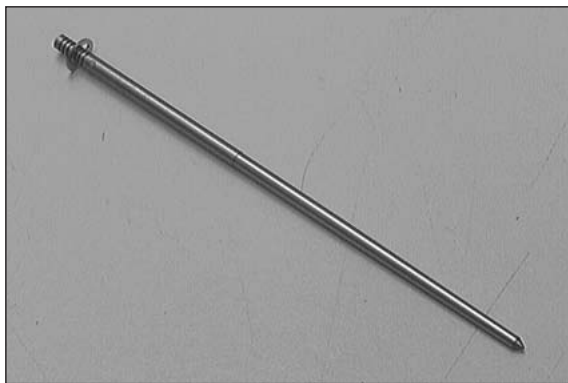


Checking the accelerator pump

Check the membranes for cracking or brittleness.

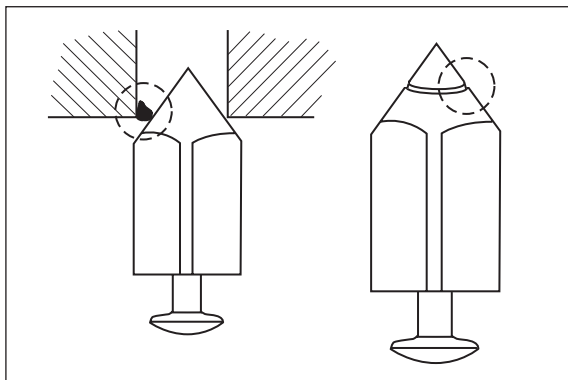
Check gaskets for damage.

Check if the bores ❷ are unobstructed.



Checking the jet needle

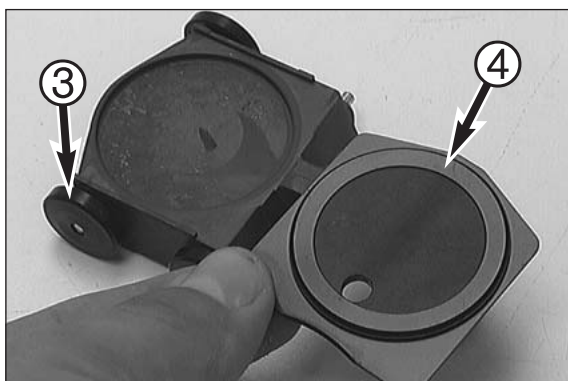
Check the jet needle for bending and wear.



Checking the float needle valve

Check the sealing surface of the needle valve for notches.

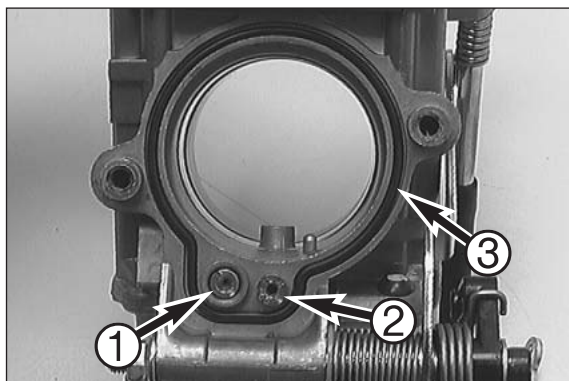
There must not be any dirt between the valve seat and the float needle.



Checking the throttle valve

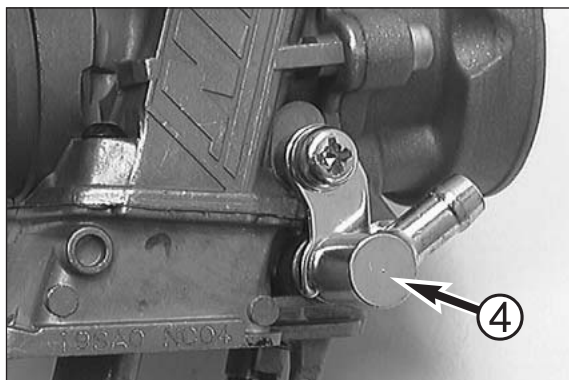
The rollers ❸ at the throttle valve must be easy to turn and must not have any flat spots.

Check the throttle valve paddles ❹ for damage.



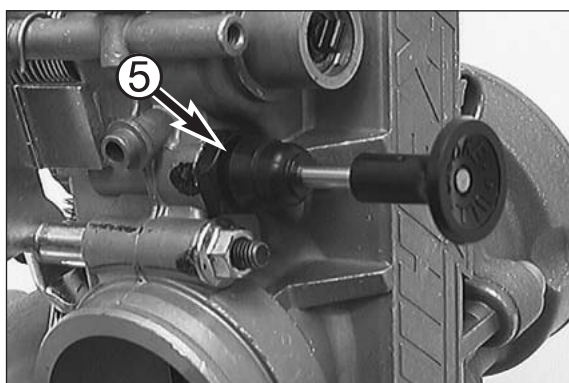
Assembling the carburetor FCR 35/39

- Mount the idle-air jet ① and the main air jet ②.
- Place the O-ring ③ in the groove and secure the intake trumpet to the carburetor by means of the 2 screws.

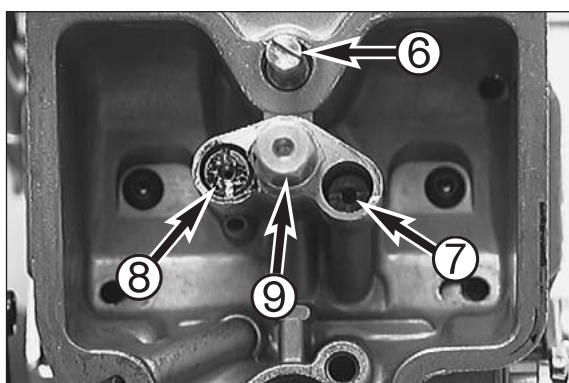


- Insert the fuel connection ④ into the carburetor and secure it with the clip.

NOTE: In the mounted state, the connection piece must be easy to turn.



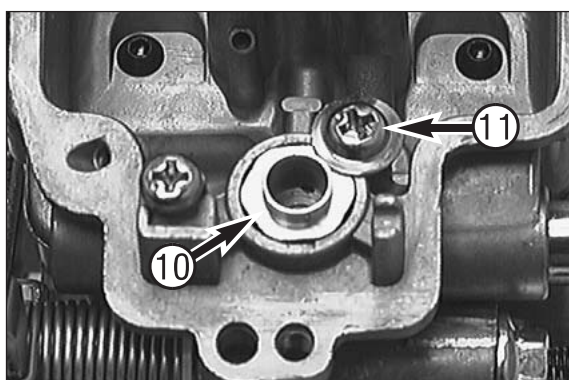
- Mount the choke slide ⑤ and actuate it several times, checking whether it can be moved smoothly. In addition, check whether the choke locks properly.



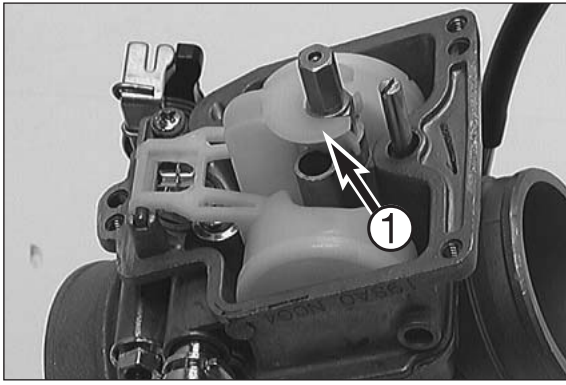
- Thread the spring, the washer and the O-ring onto the mixture control screw ⑥ and screw the mixture control screw in as far as it will go.
- Now, unscrew the mixture control screw the number of turns written down during disassembly.

BASIC SETTING: See technical specification

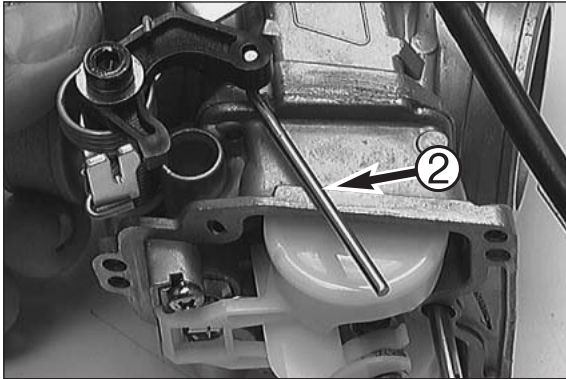
- Mount idling jet ⑦, starting jet ⑧ and needle jet together with main jet ⑨.



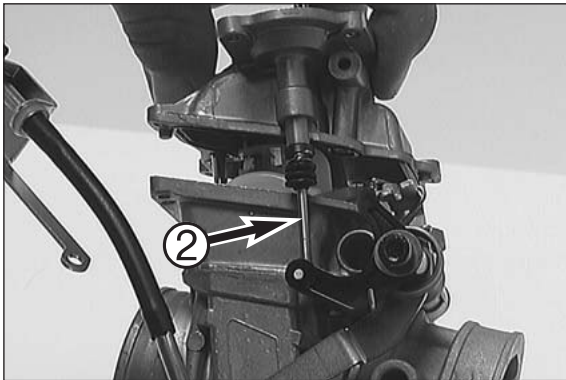
- Insert the needle jet ⑩ into bore and secure it by means of the screw ⑪.



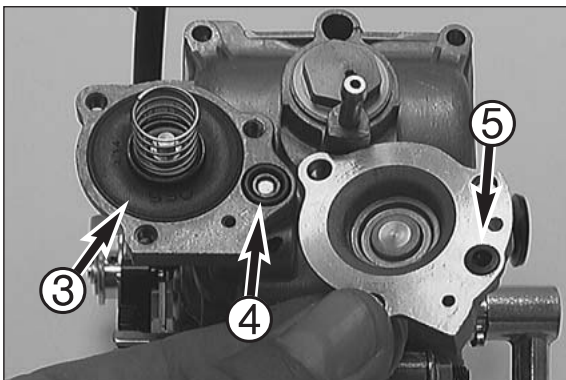
- Position the float, mount the float hinge pin and secure it by means of the screw.
- Check the float level (see page 8-20).
- Stick the plastic component **1** on the needle jet.



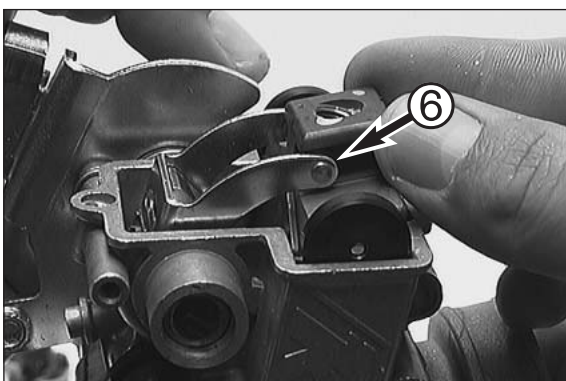
- Engage the push rod **2** of the accelerator pump at the lever.



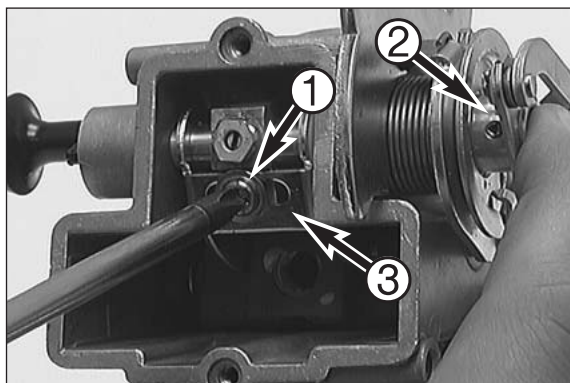
- Mount the float chamber and at first secure it with only 1 screw. When positioning the float chamber, make sure that the push rod **2** of the accelerator pump slides into the bore.



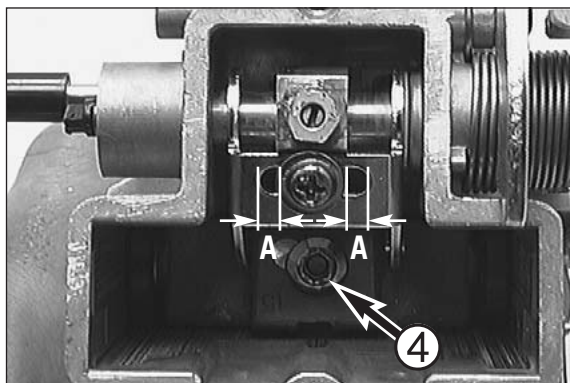
- Place the membrane **3** with the labeling facing upwards and the spring into the pump housing.
- Place the O-ring **4** into the groove. Secure the sealing ring **5** with some grease in the cover and fasten the cover by means of 3 screws.



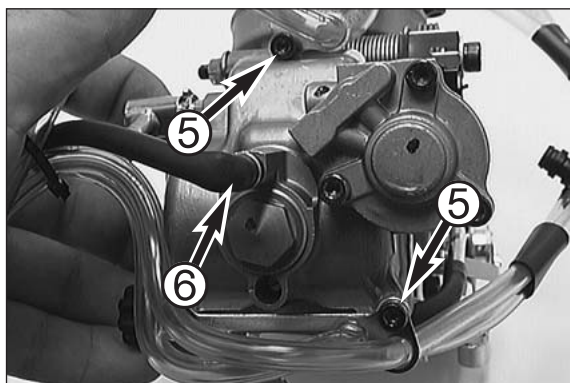
- Turn the cable disc and push the throttle valve into the carburetor such that the rollers **6** engage the throttle valve (see photo). Push the throttle valve all the way into the carburetor.
- Turn the cable disc several times and while doing so check whether the throttle valve moves smoothly.



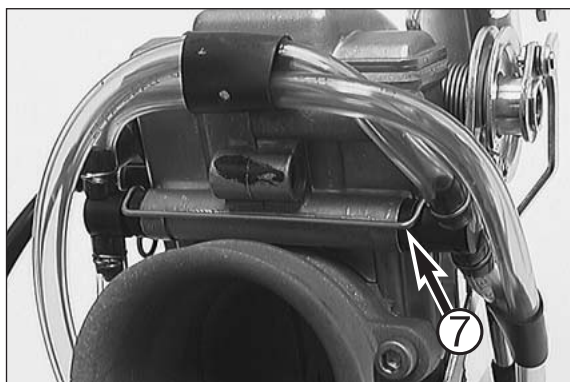
- Coat the thread of the screw ❶ with Loctite 243 and mount the screw, however, do not tighten it yet.
- Push the slide pin ❷ inward. At the same time, push the slide lever ❸ to the extreme right and tighten the screw ❶.



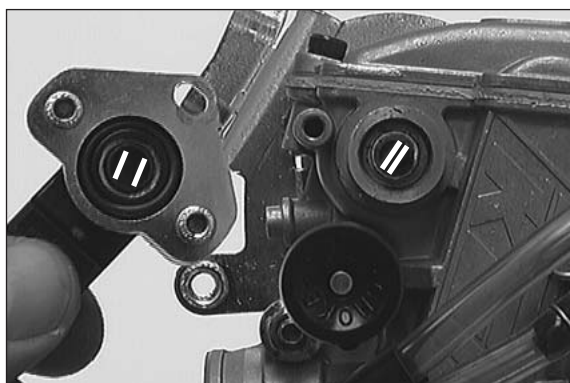
- Now, the distances ❸ on the left and on the right should be identical. Then, turn the cable disc and check if the throttle valve moves smoothly.
- Mount the jet needle and secure it with the screw ❹.
- Position the slide cover and gasket and fasten with 2 screws.



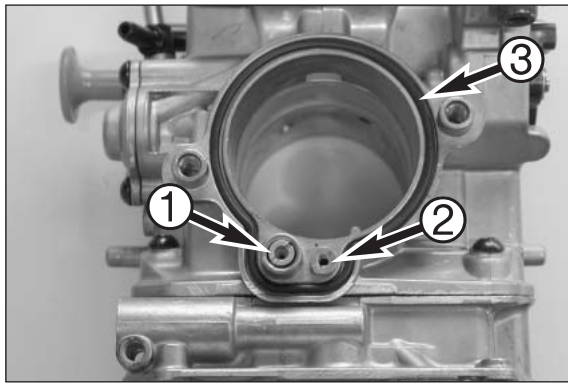
- Secure the ventilation hoses with the 2 screws ❺ of the float chamber and connect the hose ❻.



- Insert the 2 hose connections into the bores and fasten them with the retaining clip ❼.

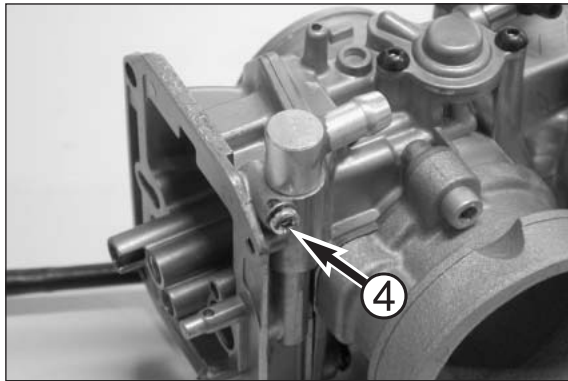


- Mount the throttle valve sensor such that the flat spot at the carburetor engages the groove of the throttle valve sensor and secure it by means of the screw.



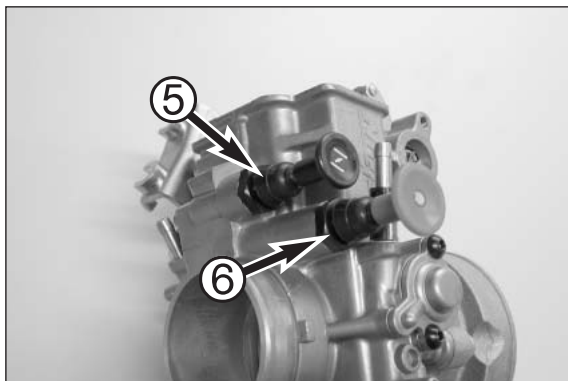
Assembling the carburetor Keihin FCR - MX 37/39/41

- Mount the idle-air jet ① and the main air jet ②.
- Place the O-ring ③ in the groove and secure the intake trumpet to the carburetor by means of the 2 screws.

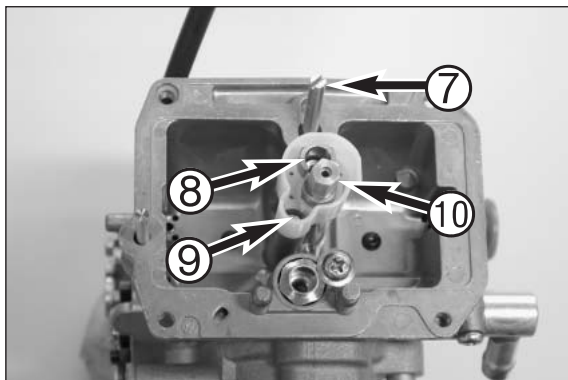


- Insert the fuel port in the carburetor and fix with screw ④.

NOTE: In the mounted state, the connection piece must be easy to turn.



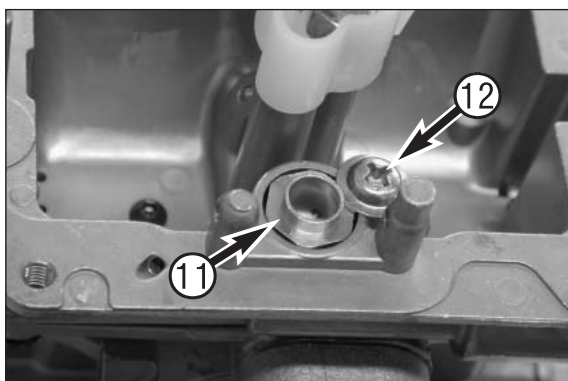
- Mount the choke slide ⑤, the hot start knob ⑥ and actuate several times, checking for smooth operation. Also make sure the choke and the hot start knob lock into place.



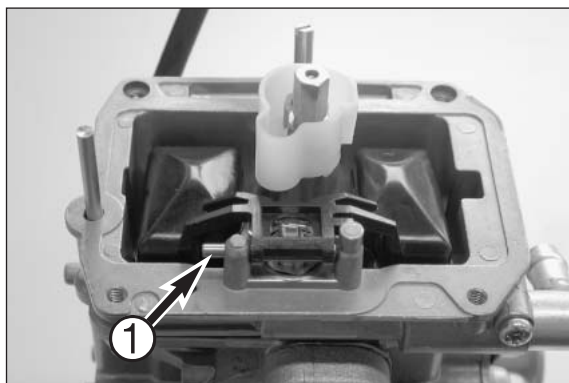
- Thread the spring, the washer and the O-ring onto the mixture control screw ⑦ and screw the mixture control screw in as far as it will go.
- Now, unscrew the mixture control screw the number of turns written down during disassembly.

NOTE: See the Technical Specifications for the basic carburetor setting.

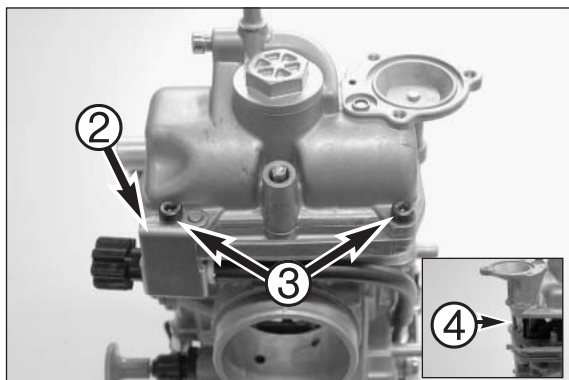
- Mount idling jet ⑧, starting jet ⑨ and needle jet together with main jet ⑩.



- Insert the needle valve seat ⑪ in the bore and fix with screw ⑫.

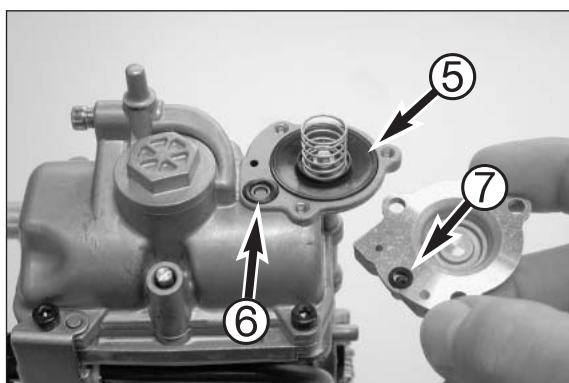


- Position the float and the float needle valve and mount the float hinge pin **1**.
- Check the float level (see page 8-21).

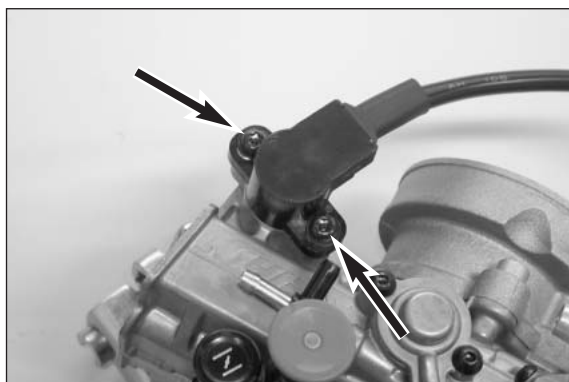


- Mount the float chamber and the gasket, position the bracket for the adjustment screw **2** and fix the float chamber with the screws **3**.

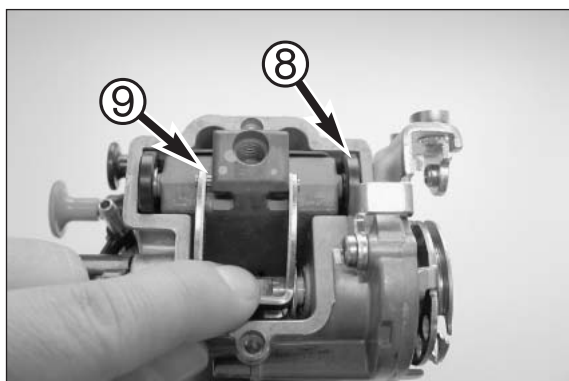
NOTE: When positioning the float chamber, make sure that the push rod **4** of the accelerator pump slides into the bore.



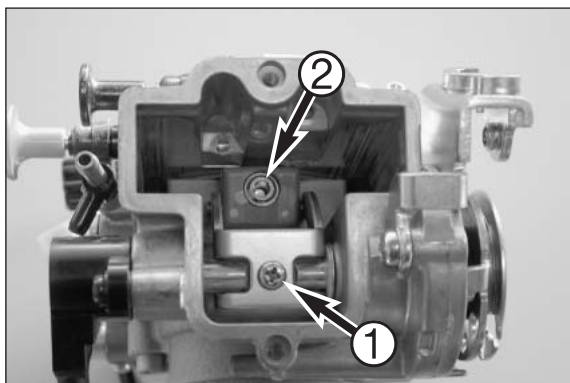
- Place the membrane **5** with the labeling facing upwards and the spring into the pump housing.
- Place the O-ring **6** into the groove. Secure the sealing ring **7** with some grease in the cover and fasten the cover by means of 3 screws.



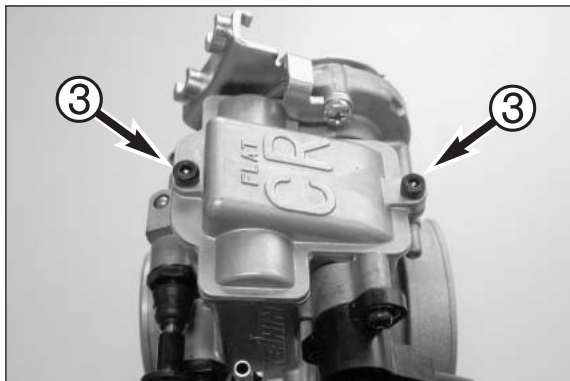
- Mount the throttle valve sensor such that the flat spot at the carburetor engages the groove of the throttle valve sensor and secure it by means of the screw.



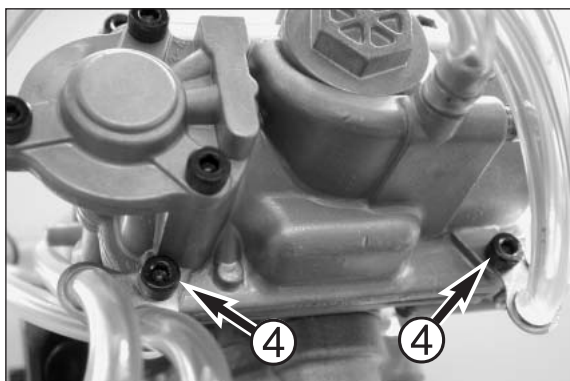
- Pull up the throttle slide arm, push the throttle slide together with roll **8** and the slide shim into the carburetor so that the rolls **9** engage in the throttle slide (see illustration).
- Check the throttle slide for smooth operation.



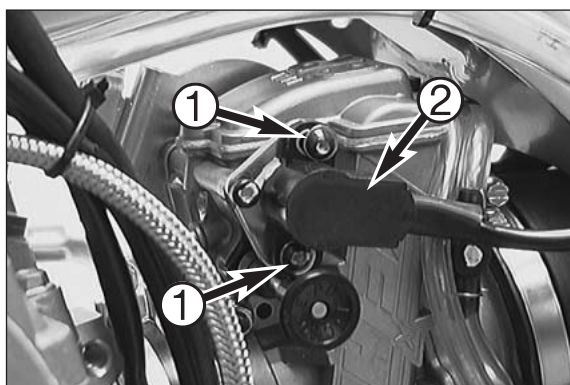
- Apply Loctite 243 to the screw ❶ and tighten.
- Mount the jet needle and fix with the screw ❷.



- Position the slide cover with the gasket and fasten with the 2 screws ❸.



- Fix the vent hoses on the float chamber with the 2 screws ❹.



Adjusting the position of the throttle valve sensor

NOTE: Before checking the position of the throttle valve sensor, you have to adjust the idle speed correctly.

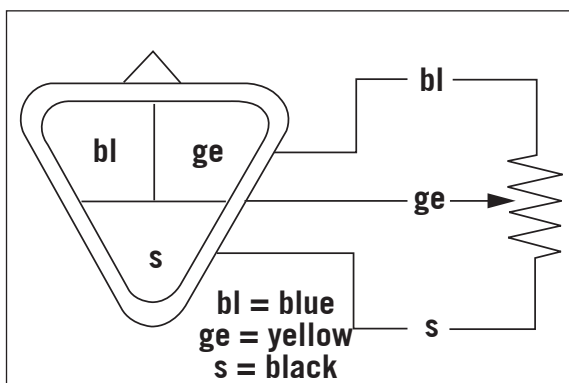
- Disengage the plug-and-socket connection of the throttle valve sensor.
- Connect a multimeter (measuring range $\Omega \times 1k$) to the **blue (+)** and the **black (-)** cable of the throttle valve sensor and measure the throttle valve resistance.
- Now, multiply this value by 0.15. This yields the adjustment value for the throttle valve sensor.



EXAMPLE:

Throttle valve sensor resistance (bl/s) = $5k\Omega$

Throttle valve sensor resistance (ge/s) =
 $5k\Omega \times 0.15 = 750\Omega \pm 50\Omega$



- Connect the multimeter (measuring range $\Omega \times 100$) to the **yellow (+)** and the **black (-)** cable of the throttle valve sensor and measure the throttle valve sensor resistance with the throttle grip closed. According to the above example, this value should be $750\Omega \pm 50\Omega$.
- If the value measured does not correspond to the desired value, loosen the 2 screws ① and turn the throttle valve sensor ② until the instrument displays the desired value.
- Secure the throttle valve sensor in this position by fastening the screws and check the value once more.
- Connect the throttle valve sensor to the wiring harness.

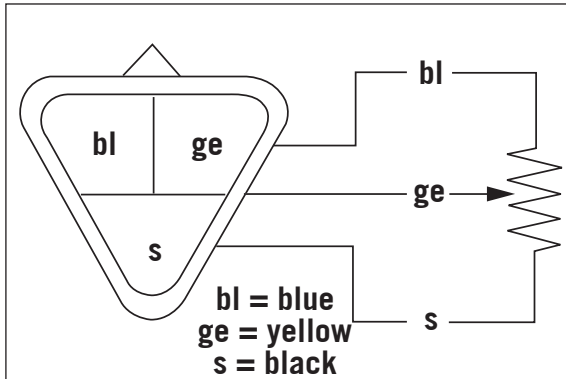


Checking the throttle valve sensor

NOTE: The following measurement must be taken at a component temperature of approx. 20°C.

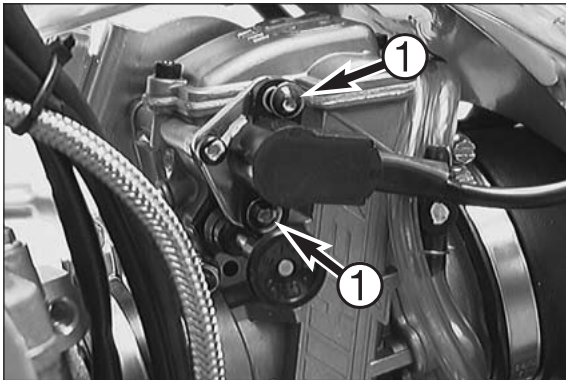
- Open the plug-and-socket connection of the throttle valve sensor.
- Connect a multimeter (measuring range $\Omega \times 1k$) to the **blue (+)** and the **black (-)** cable of the throttle valve sensor.

Resistance of throttle valve sensor: 4 - 6 k Ω



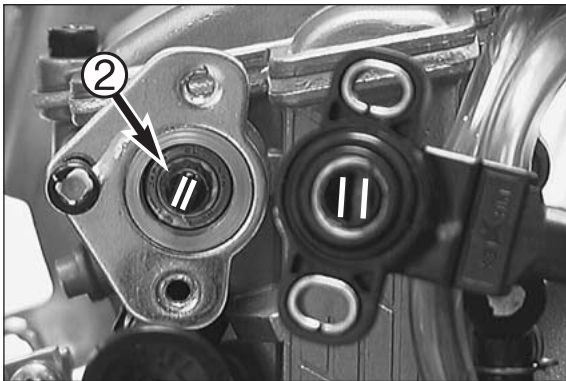
- Now, connect the multimeter to the **yellow (+)** and the **black (-)** cable of the throttle valve sensor.
- As you open the throttle grip slowly, the resistance must change evenly.

Resistance of throttle valve sensor: 0-5 k Ω ± 1 k Ω
(while opening the throttle grip)

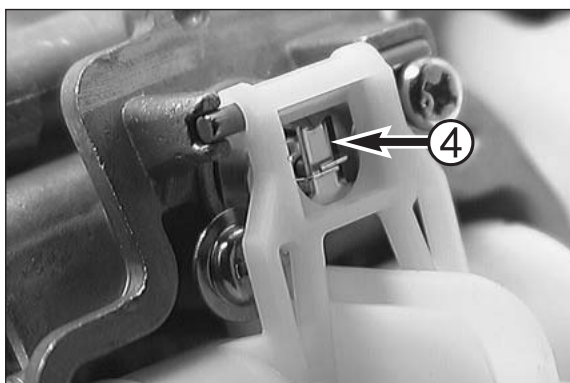
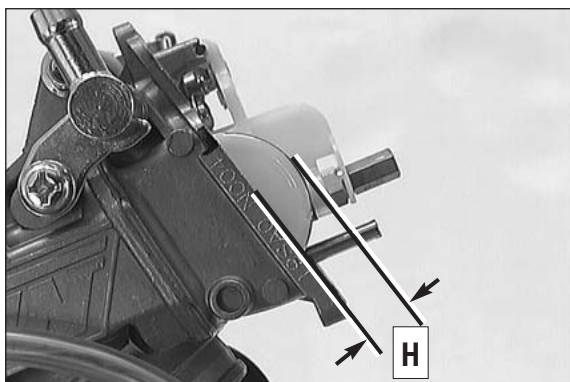
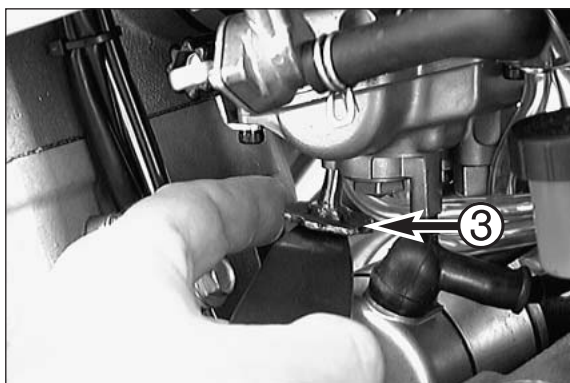
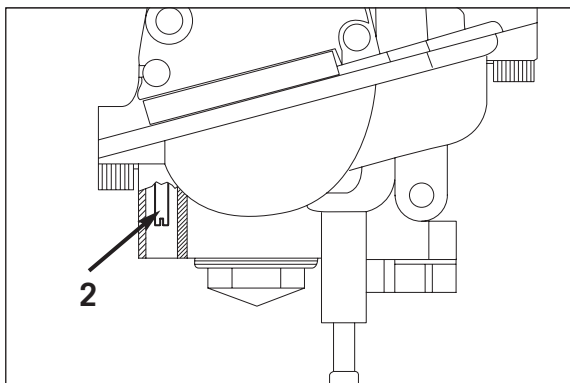
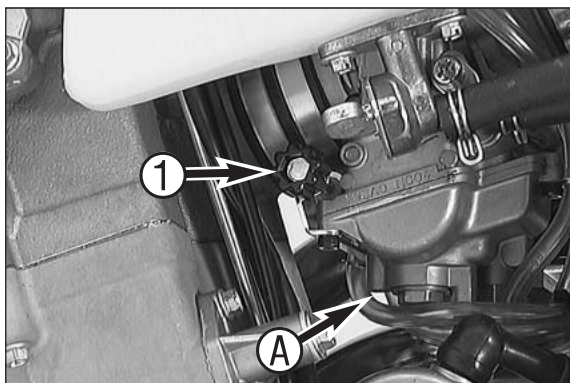


Dismounting and installing the throttle valve sensor

- Disconnect the plug-and-socket connection of the throttle valve sensor and remove the screws ❶.
- Take the throttle valve sensor off the carburetor.



- When mounting the throttle valve sensor, make sure that the flat spot at the throttle valve pin engages the groove on the throttle valve sensor.
- Mount the 2 screws, however, do not yet tighten them fully and adjust the position of the throttle valve sensor. Secure the 2 screws with Loctite 243.



CARBURETOR – Adjust idling FCR 35/39

Idling adjustment of the carburetor strongly affects the engine's starting behavior. An engine whose idling speed is adjusted correctly will be easier to start than one whose idling speed has not been adjusted correctly.

The idle speed is controlled by means of the adjusting wheel ① and the mixture control screw ②. The adjusting wheel is used to adjust the basic setting of the slide. The mixture control screw is used to control the idle mixture which arrives at the engine by way of the idle system. Clockwise turning reduces the fuel quantity (lean mixture), counterclockwise turning increases the fuel quantity (rich mixture).

TO ADJUST IDLING CORRECTLY, PROCEED AS FOLLOWS:

1. Turn in the mixture control screw ② up to the stop, and turn it back out to the basic position (see technical data for engine)
2. Warm up the engine
3. Use the adjusting wheel ① to set the normal idle speed (1400 - 1500 rpm).
4. Turn mixture control screw ② slowly clockwise until the idling speed starts to decrease. Memorize this position, and turn mixture control screw slowly counterclockwise until the idling speed decreases again. Adjust the point of the highest idling speed between these two positions. If, in the course of this procedure, the speed undergoes a relatively high increase, reduce the idle speed to a normal level and repeat the procedure specified in 4. Serious competitive racers will choose a setting approx. 1/4 turn (clockwise) leaner than this ideal value because their engine will heat up more when used in competitions.

NOTE: If you fail to obtain a satisfying result by following the procedure described above, an incorrectly dimensioned idling nozzle may be the cause. In this case:

a) the mixture control screw has been screwed in up to the stop without causing any change in rotational speed, a smaller idling jet has to be installed;

b) the engine dies when the mixture control screw is still open by 2 turns, a larger idling jet needs to be selected; Naturally, in cases of jet changes, you have to start adjusting from the beginning.

5. Then, use the adjusting wheel to set the desired idle speed.
6. In cases of greater changes in outside temperature and extremely different altitudes, the idling speed should be readjusted.

Adjusting the mixture control screw

Especially on the EXC models, accessing the mixture control screw is difficult. For this reason, we have created an appropriate special tool. Introduce the special tool into the bore ① at the carburetor bottom. Press the tool slightly upward and turn the adjusting wheel ③ until the tool engages the slot of the mixture control screw ②.

Now, you can go about adjusting the screw. Marks were provided on the adjusting wheel, making it easier to keep track of the turns.

Checking the float level (float height)

For this purpose, dismount the carburetor and remove the float chamber. Hold the carburetor in a slanted position such that the float will abut the float needle valve but not compress it (see photo).

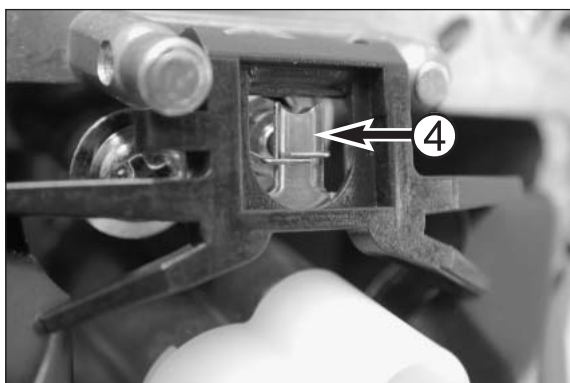
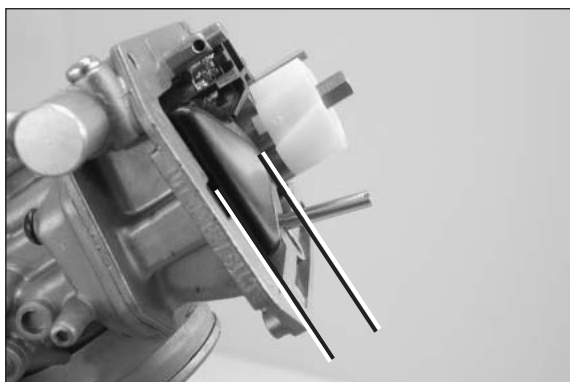
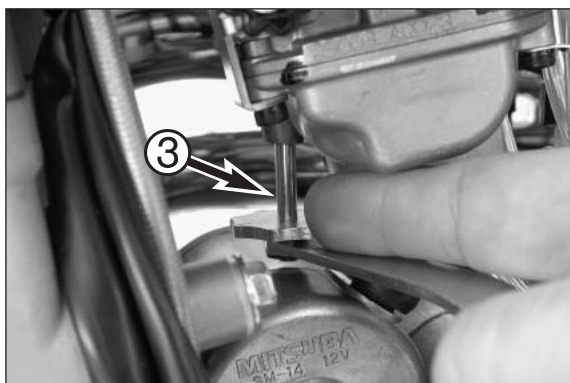
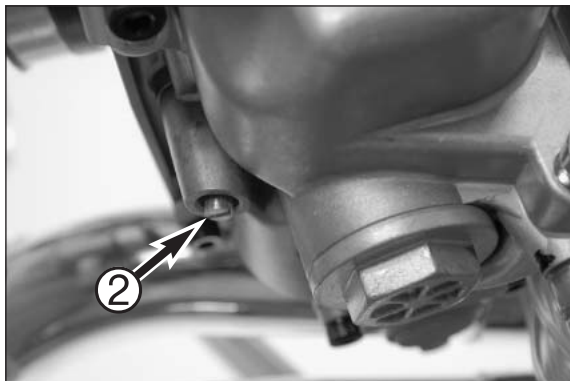
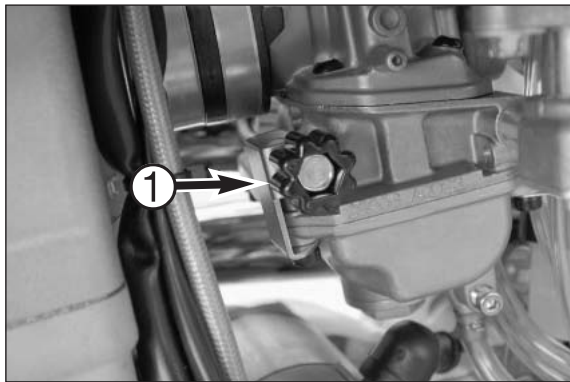
Now, use a sliding caliper to measure the distance ④ between the casing edge and the float's upper edge.

The float height ④ should be **9 mm (0.3543 in)**.

If the float height does not correspond to the desired value, check the float needle valve and, if necessary, replace it.

If the float needle valve is o.k., you can adjust the float height by bending the float lever ④.

Mount the float chamber, install the carburetor, and adjust the idle speed.



CARBURETOR – Adjust idling (Keihin-FCRMX 37/39/41)

Idling adjustment of the carburetor strongly affects the engine's starting behavior. That is, an engine whose idling speed is adjusted correctly will be easier to start than one whose idling speed has not been adjusted correctly.

The idle speed is controlled by means of the adjusting wheel ① and the mixture control screw ②. The adjusting wheel is used to adjust the basic setting of the slide. The mixture control screw is used to control the idle mixture which arrives at the engine by way of the idle system. Clockwise turning reduces the fuel quantity (lean mixture), counterclockwise turning increases the fuel quantity (rich mixture).

TO ADJUST IDLING CORRECTLY, PROCEED AS FOLLOWS:

1. Turn in mixture control screw ② up to the stop, and turn it back out to the basic position (see technical data-engine)
2. Warm up the engine
3. Use the adjusting wheel ① to set the normal idle speed (1400 - 1500 rpm).
4. Turn mixture control screw ② slowly clockwise until idling speed starts to decrease. Memorize this position, and turn mixture control screw slowly counterclockwise until the idling speed decreases again. Adjust the point of the highest idling speed between these two positions. If, in the course of this procedure, the speed undergoes a relatively high increase, reduce the idle speed to a normal level and repeat the procedure specified in 4. Serious competitive racers will choose a setting approx. 1/4 turn (clockwise) leaner than this ideal value because their engine will heat up more when used in competitions.

NOTE: If you fail to obtain a satisfying result by following the procedure described above, an incorrectly dimensioned idling nozzle may be the cause. If:

- a) the mixture control screw has been screwed in up to the stop without causing any change in rotational speed, a smaller idling jet has to be installed;
- b) the engine dies when the mixture control screw is still open by 2 turns, a larger idling jet needs to be selected.

Naturally, in cases of jet changes, you have to start your adjusting work from the beginning.

5. Then, use the adjusting wheel to set the desired idle speed.
6. In cases of greater changes in the outside temperature and extremely different altitudes, the idling speed should be readjusted.

Basic information on carburetor wear

As a result of engine vibrations, the throttle valve, jet needle, and needle jet are subjected to increased wear. This wear may cause the carburetor to malfunction (e.g., overly rich mixture). Therefore, these parts should be replaced after 200 hours.

Adjusting the mixture control screw

Especially on the EXC models, accessing the mixture control screw is difficult. For this reasons, we have created an appropriate special tool.

Introduce the special tool on the mixture control screw ② at the carburetor bottom. Press the tool slightly upward and turn the adjusting wheel ③ until the tool engages the slot of the mixture control screw.

Now, you can go about adjusting the screw. Marks were provided on the adjusting wheel, making it easier to keep track of the turns.

Checking the float level (float height)

For this purpose, dismount the carburetor and remove the float chamber. Hold the carburetor in a slanted position such that the float will abut the float needle valve but not compress it.

In this position, the edge of the float should be parallel with the float chamber sealing surface (see illustration).

If the float height does not correspond to the desired value, check the float needle valve and, if necessary, replace it.

If the float needle valve is o.k., you can adjust the float height by bending the float lever ④.

Mount the float chamber, install the carburetor, and adjust the idle speed.

TROUBLE SHOOTING

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250 - 610 RACING9-2

TROUBLE SHOOTING

If you had the specified maintenance work on your motorcycle carried out, disturbances can hardly be expected. Should an error occur nevertheless, we advise you to use the troubleshooting chart in order to find the cause of error.

We would like to point out that many operations cannot be performed by yourself. In case of uncertainty, please contact a KTM-dealer.

TROUBLE	CAUSE	REMEDY
Engine doesn't crank (E-starter).	Operating error	Turn on the emergency-OFF switch (Australia only)
	Blown fuse	Dismount the left paneling and the filter box cover and replace the fuse in the starter relay.
	Discharged battery.	Recharge the battery and investigate the causes for discharging; contact a KTM dealer.
	Low outside temperature	Start the engine with the kickstarter
Engine cranks but doesn't start (E-starter). Engine will not start (Kickstarter).	Operating error	Open fuel tap, tank fuel, actuate choke. Pay attention to starting information (see driving instructions).
	The motorcycle has been out of operation for a longer period of time. Therefore old fuel has accumulated in the float chamber	The easily inflammable components of the new fuels evaporate during longer periods of standing still. When the motorcycle has been out of operation for more than a week, it is therefore recommended to drain the old fuel from the float chamber. The engine will immediately start when the float chamber is filled with new fuel.
	Fuel supply interrupted	Close fuel tap, loosen fuel hose at carburetor, lead into a basin and open fuel tap – if fuel leaks out, the carburetor may need cleaning – if no fuel leaks out, check tank ventilation, i.e. clean fuel tap
	Flooded engine	In order to "pump the engine free", pull the hand decompression lever, fully rev up the engine, actuate the kickstarter 5 to 10 times or actuate the E-starter 2 times for 5 seconds each. Then, start the engine as described above. If the engine fails to start, unscrew the spark plug and dry it.
	Sooty or wet spark plug	Clean and dry the spark plug or exchange it, respectively
	Electrode gap too large	Adjust spark plug electrode gap to 0.6 mm
	Spark plug connector or spark plug faulty	Dismount spark plug, connect ignition cable, hold to ground (blank place on engine) and actuate starter, a strong spark must be produced at the spark plug – If no spark is created replace the spark plug. – If the new spark plug doesn't produce a spark either, disconnect the spark plug connector from the ignition cable, hold it a distance of approx. 5 mm from ground and start. – If a spark now occurs, replace spark plug cap – If no spark is produced, control ignition system
	Short circuit cable scored in wiring harness, emergency OFF switch or short circuit button faulty	Dismount the fuel tank, disconnect the black/yellow cable from the cable of the emergency-OFF switch and the short-circuit button, respectively, and check the ignition spark. If a spark is generated, look for the problem in the short-circuit circuit.
	The plug connection of the CDI-unit, the pulse generator or the ignition coil has oxydized	Remove the seat and the fuel tank. Clean the plug connection and treat it with contact spray
	Water in carburetor or jets blocked	Dismount and clean the carburetor
Engine fails to idle	Glogged idling jet	Disassemble the carburetor and clean the jets
	Incorrect adjustment of adjusting screws on carburetor	Have the carburetor adjusted
	Defective spark plug	Replace the spark plug
	Defective ignition system	Have the ignition system checked

9-3E

TROUBLE	CAUSE	REMEDY
Engine does not rev high	Carburetor fuel level too high because float needle valve is dirty or worn out Loose carburetor jets Electronic ignition timing faulty	Dismount carburetor and check if worn out Tighten jets Have ignition system checked
Engine will not reach full power	Fuel supply partially interrupted or carburetor dirty Float leaks Air filter very dirty Exhaust system is not tight, deformed, or the silencer does not contain enough glassfiber yarn Valve gap too small Loss of compression because hand decompressor has no play Electronic ignition timing faulty	Clean and check fuel system as well as carburetor Replace the float Clean or replace air filter Check if exhaust is damaged, replace glasfiber yarn in exhaust silencer Adjust valve gap Check setting of the hand decompression cable Have ignition system checked
Engine stops or splutters in carburetor	Insufficient fuel Engine takes air out of control	Clean and check fuel system and carburettor Check rubber sleeve and carburetor for tight fit
Engine gets too hot	Insufficient cooling liquid Not enough air stream Cooling system has not been bled Radiators very dirty Foam formation in cooling system Bent cooling hose Thermostat defective	Refill cooling liquid (see maintenace work), check cooling system for leaks Drive on briskly (electric fan can be retrofitted) Bleed cooling system Clean radiators with water jet Replace cooling liquid, use antifreeze liquid with brand name Shorten or replace cooling hose Dismount and check thermostat (opening temperature 70°C, (158°F) or replace it
High oil consumption	Hose of engine ventilation is bent Engine oil level too high Motor oil too thin (viscosity)	Dislocate i.e. replace non-buckling vetilation hose Check engine oil level and, if necessary, correct it Use thicker engine oil; see chapter “Engine oil“
All switched on lamps blown out	Capacitor or voltage regulator faulty	Dismount seat and fuel tank and check connections, have capacitor and voltage regulator checked
Horn, flasher lights and E-starter do not work	Blown fuse in the starter relay	Dismount left side paneling and filter box cover, replace fuse
The battery is discharged	The battery isn't charged by the generator because	Remove seat and fuel tank and check voltage regulator connections; voltage regulator and generator should be checked by a KTM dealer.

TECHNICAL SPECIFICATIONS

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TECHNICAL DATA – ENGINE 400/520 SX, EXC RACING 2000

Type	400 SX RACING	400 EXC RACING	520 SX RACING	520 EXC RACING
Design	Liquid-cooled single cylinder 4-stroke engine with balancer shaft			
Displacement	398 cm³		510 cm³	
Bore/Stroke	89 / 64 mm		95 / 72 mm	
Ratio	11 : 1			
Fuel	unleaded premium gasoline with at least RON 95			
Valve timing	4 valves over rocker arm and 1 overhead camshaft, camshaft drive through single chain			
Camshaft	01		55	
Valve diameter	Intake: 35 mm Exhaust: 30 mm			
Valve clearance cold	0.12 mm (feeler gage 0.10 mm light, feeler gage 0.15 mm should not be inserted)			
Crankshaft bearing	2 cylinder roller bearing			
Conrod bearing	needle bearing			
Top end bearing	bronze bushing			
Piston	alluminium alloy cast		alluminium alloy forged	
Piston rings	1 compression ring, 1 oil scraper ring			
Engine lubrication	pressure circulation lubrication with 2 rotorpumps			
Engine oil	fullsynthetic oil (Shell Advance Ultra4 SAE 10W40)			
Quantity of engine oil	1.25 liters			
Primary ratio	straight geared spur wheels 33:76 Z			
Clutch	multi disc clutch in oil bath			
Transmission	4-speed claw shafted	6-speed claw shafted	4-speed claw shafted	6-speed claw shafted
Gear ratio				
1 st Gear	14:34	14:34	14:34	14:34
2 nd Gear	18:30	17:31	18:30	17:31
3 rd Gear	20:28	19:28	20:28	19:28
4 th Gear	22:26	22:26	22:26	22:26
5 th Gear	–	24:23	–	24:23
6 th Gear	–	26:21	–	26:21
Ignition system	contactless DC-CDI ignition with digital advanced system by KOKUSAN			
Generator	12V 40W	12V 110W		
Spark plug	NGK CR8 EK			
Spark plug gap	0.60 mm			
Cooling system	liquid cooled, permanent rotation of cooling liquid through mechanic driven water pump			
Cooling liquid	1 liter, 40% antifreeze, 60% water, at least -25° C (-13° F)			
Starting equipment	kickstarter	kick - electric starter	kickstarter	kick - electric starter

BASIC CARBURETOR SETTING

	520 SX RACING 400 EXC RACING	400 EXC RACING (12kW) 520 EXC RACING (12,5kW)	520 EXC RACING	400 SX RACING
Type	MX-FCR39	MX-FCR39	MX-FCR39	MX-FCR39
Carb.-setting number	250899	130799	100699	031299
Main jet	175	175	175	175
Jet needle	OBDTM	OBDVR (OBDTM)	OBDTM	OBDTM
Idling jet	52	48	48	48
Main air jet	200	200	200	200
Idling air jet	100	100	100	100
Needle clip position	2. from top	3. from top	2. from top	4. from top
Starting jet	85	85	85	85
Mixture control screw open	2	1,25	2,5	2,25
Throttle valve	15	15	15	15
Performance restrictor	–	slide stop 24,5 mm	–	–
Stop pump membrane	055	055	055	055

TECHNICAL DATA – CHASSIS 400/520 SX, EXC RACING 2000

	400 SX RACING	520 SX RACING	400/520 EXC RACING	400/520 EXC RACING USA
Frame	Central chrom-moly-steel frame			
Fork	White Power – Up Side Down 43 MA			
Wheel travel front/rear	295/320 mm			
Rear suspension	WP Progressive Damping System shock absorber, aluminium swingarm			
Front brake	Disc brake with carbon-steel brake disc Ø 260 mm (10.2 in), brake caliper floated			
Rear brake	Disc brake with carbon-steel brake disc Ø 220 mm (8.7 in), brake caliper floated			
Brake disc	Wear limit max. 0,40 mm (0,016 in)			
Front tires	80/100 - 21"		90/90 - 21"	80/100 - 21"
Air pressure offroad	1,0 bar (14 psi)		1,0 bar (14 psi)	1,0 bar (14 psi)
Air pressure road driver only	–		1,5 bar (21 psi)	1,5 bar (21 psi)
Rear tires	110/90 - 19"		140/80 - 18"	110/100 - 18"
Air pressure offroad	1,0 bar (14 psi)		1,0 bar (14 psi)	1,0 bar (14 psi)
Air pressure road driver only	–		2,0 bar (28 psi)	2,0 bar (28 psi)
Fuel tank capacity	7,5 Liter (2 US Gallons)		9 Liter (2,3 US gallons)	
Final drive ratio	14:50	14:48	400-15:45 / 520-15:40	400-14:50 / 520-14:48
Chain	O-ring 5/8 x 1/4 "			
Available final sprockets	38, 40, 42, 45t 48, 50, 52			
Steering head angle	63,5°			
Wheel base	1481 ± 10 mm (58,3 ± 0,4 in)			
Seat height, unloaded	925 mm (36,5 in)			
Ground clearance, unloaded	380 mm (15,1 in)			
Dead-weight *	107 kg (236 lbs)		112 kg (247 lbs)	

* Dead-weight without fuel

STANDARD ADJUSTMENT-FORK		
	WP 0518U782	WP 0518U791
Compression adjuster	14	14
Rebound adjuster	14	14
Spring	4,2 N/mm	4,2 N/mm
Spring preload	7 mm (0.27in)	6,5 mm (0.26in)
Air chamber length	120 mm (5.2in)	140 mm (5.5in)
Capacity per fork leg	approx. 450 ccm	approx. 450 ccm
Fork oil	SAE 5	SAE 5

STANDARD ADJUSTMENT - SHOCK ABSORBER		
	WP 1218U721	WP 1218U716
Compression adjuster	5	5
Rebound adjuster	20	18
Spring	PDS2-250	PDS3-250
Spring preload	6 mm (0.24 in)	6 mm (0.24 in)

TECHNICAL DATA – ENGINE 400/520 SX, MXC, EXC RACING 2001

Type	400 SX	400 MXC	400 EXC	520 SX	520 MXC	520 EXC
Design	Liquid-cooled single cylinder 4-stroke engine with balancer shaft					
Displacement	398 cc			510 cc		
Bore/Stroke	89 / 64 mm			95 / 72 mm		
Ratio	11 : 1					
Fuel	unleaded premium gasoline with at least RON 95					
Valve timing	4 valves over rocker arm and 1 overhead camshaft, camshaft drive through single chain					
Camshaft	0121			5521		
Valve diameter	Intake: 35 mm Exhaust: 30 mm					
Valve clearance cold	0,12 mm (0.0047 in)					
Crank shaft bearing	2 cylinder roller bearing					
Connecting rod bearing	needle bearing					
Top end bearing	bronze bushing					
Piston	aluminium alloy cast			aluminium alloy forged		
Piston rings	1 compression ring, 1 oil scraper ring					
Engine lubrication	pressure circulation lubrication with two rotor pumps					
Engine oil	full synthetic oil (Shell Advance Ultra 4 SAE 10W40)					
Quantity of engine oil	1.25 liters					
Primary ratio	straight geared spur wheels 33:76 Z					
Clutch	multidisc clutch in oil bath					
Transmission claw shifted	6-speed	6-speed	6-speed	4-speed	6-speed	6-speed
Gear ratio						
1 st Gear	16:32	16:32	14:34	16:32	16:32	14:34
2 nd Gear	18:30	18:30	17:31	18:30	18:30	17:31
3 rd Gear	20:28	20:28	19:28	20:28	20:28	19:28
4 th Gear	22:26	22:26	22:26	22:26	22:26	22:26
5 th Gear	24:24	24:24	24:23	-	24:24	24:23
6 th Gear	21:18	21:18	26:21	-	21:18	26:21
Ignition system	contactless DC-CDI ignition with digital advanced system by KOKUSAN					
Generator	12V 40W	12V 150W				
Spark plug	NGK CR8 EK					
Spark plug gap	0.6 mm (0.0236 in)					
Cooling system	liquid cooled, permanent rotation of cooling liquid through mechanically driven water pump					
Cooling liquid	1 liter, 40% antifreeze, 60% water, at least -25° (-13° F)					
Starting equipment	kickstarter	kick - electric starter		kickstarter	kick - electric starter	

BASIC CARBURETOR SETTING

	400 SX RACING 400 MXC/EXC RACING	400 EXC RACING (12kW) 520 EXC RACING (12,5kW)	520 MXC/EXC RACING	520 SX RACING
Type	MX-FCR39	MX-FCR39	MX-FCR39	MX-FCR39
Carb.-setting number	031299	130799	100699	250899
Main jet	175	175	175	175
Jet needle	OBDTM	OBDVR (OBDTM)	OBDTM	OBDTM
Idling jet	48	48	48	48
Main air jet	200	200	200	200
Idling air jet	100	100	100	100
Needle clip position	4th from top	3rd from top	2nd from top	3rd from top
Starting jet	85	85	85	85
Mixture control screw open	1	1,25	2,5	1
Slide	15	15	15	15
Performance restrictor	-	slide stop 24,5 mm	-	-
Stop pump membrane	055	055	055	055

TECHNICAL DATA – CHASSIS 400/520 SX, MXC, EXC RACING 2001

	400 SX RACING	520 SX RACING	400/520 EXC RACING	400/520 EXC USA, MXC
Frame	Central tube chrome-moly-steel frame			
Fork	White Power – Up Side Down 43 MA			
Wheel travel front/rear	295/320 mm			
Rear suspension	WP Progressive Damping System shock absorber, aluminium swing arm			
Front brake	Disk brake with carbon-steel brake disc Ø 260 mm (10.2 in), brake caliper floated			
Rear brake	Disk brake with carbon-steel brake disc Ø 220 mm (8.7 in), brake caliper floated			
Brake disc	Wear limit max. 0,4 mm (0,016 in)			
Front tires	80/100 - 21"		90/90 - 21"	80/100 - 21"
Air pressure offroad	1.0 bar (14 psi)		1.0 bar (14 psi)	1.0 bar (14 psi)
Air pressure road driver only	–		1.5 bar (21 psi)	1.5 bar (21 psi)
Rear tires	110/90 - 19"		140/80 - 18"	110/100 - 18"
Air pressure offroad	1.0 bar (14 psi)		1.0 bar (14 psi)	1.0 bar (14 psi)
Air pressure road driver only	–		2.0 bar (28 psi)	2.0 bar (28 psi)
Fuel tank capacity	7.5 liters (2 US gallons)		EXC 8.5 liters (2.1 US gallons) MXC13 liters (3.25 US gallons)	
Final drive ratio	14:50t	14:48t	400-15:45t / 520-15:40t	400-14:50t / 520-14:48t
Chain	O-ring 5/8 x 1/4 "			
Available final sprockets	38t, 40t, 42t, 45t, 48t, 50t, 52t			
Steering head angle	63.5°			
Wheel base	1481 ± 10 mm (58.3 ± 0.4 in)			
Seat height, unloaded	925 mm (36.5 in)			
Ground clearance, unloaded	380 mm (15.1 in)			
Dead-weight *	107 kg (236 lbs)		112 kg (247 lbs)	

* Dead-weight without fuel

STANDARD ADJUSTMENT-FORK		
	WP 0518V705	WP 0518V706
Compression adjuster	14	14
Rebound adjuster	12	12
Spring	4,2 N/mm	4,2 N/mm
Spring preload	6 mm	6 mm
Air chamber length	130 mm	150 mm
Fork oil	SAE 5	SAE 5

STANDARD ADJUSTMENT - SHOCK ABSORBER		
	WP 1218V732	WP 1218V733
Compression adjuster	5	5
Rebound adjuster	25	25
Spring	PDS6-250	PDS2-250
Spring preload	6 mm	6 mm

TECHNICAL DATA – ENGINE 250/400/520 SX, MXC, EXC RACING 2002

Type	250 EXC	400 SX	400 MXC	400 EXC	520 SX	520 MXC	520 EXC
Design	Liquid-cooled single cylinder 4-stroke engine with balancer shaft						
Displacement	249.6 cc	398 cc			510 cc		
Bore/Stroke	75 / 56.5 mm	89 / 64 mm			95 / 72 mm		
Ratio	12 : 1	11 : 1					
Fuel	unleaded premium gasoline with at least RON 95						
Valve timing	4 valves over rocker arm and 1 overhead camshaft, camshaft drive through single chain						
Camshaft	5532	0121			5521		
Valve diameter Intake	28 mm	35 mm					
Valve diameter Exhaust	24 mm	30 mm					
Valve clearance cold Intake	0.12 mm (0.0047 in)						
Valve clearance cold Exhaust	0.12 mm (0.0047 in)						
Crank shaft bearing	2 cylinder roller bearing						
Connecting rod bearing	needle bearing						
Top end bearing	bronze bushing						
Piston	alluminium alloy cast				alluminium alloy forged		
Piston rings	1 compression ring, 1 oil scraper ring						
Engine lubrication	pressure circulation lubrication with two rotor pumps						
Engine oil	full synthetic oil (Shell Advance Ultra 4 SAE 10W40)						
Quantity of engine oil	1.25 liters						
Primary ratio	straight geared spur wheels 33:76 Z						
Clutch	multi disc clutch in oil bath						
Transmission claw shifted	6-speed	6-speed	6-speed	6-speed	4-speed	6-speed	6-speed
Gear ratio							
1 st Gear	14:38	16:32	16:32	14:34	16:32	16:32	14:34
2 nd Gear	16:36	18:30	18:30	17:31	18:30	18:30	17:31
3 rd Gear	19:34	20:28	20:28	19:28	20:28	20:28	19:28
4 th Gear	21:32	22:26	22:26	22:26	22:26	22:26	22:26
5 th Gear	23:30	24:24	24:24	24:23	-	24:24	24:23
6 th Gear	22:25	21:18	21:18	26:21	-	21:18	26:21
Ignition system	contactless DC-CDI ignition with digital advanced system by KOKUSAN						
Generator	12V 150W	12V 40W	12V 150W				
Spark plug	NGK CR8 EK						
Spark plug gap	0.6 mm (0.02367 in)						
Cooling system	liquid cooled, permanent rotation of cooling liquid through mechanically driven water pump						
Cooling liquid	1 liter, 40% antifreeze, 60% water, at least -25° (-13° F)						
Starting equipment	kick-electric starter	kickstarter	kick - electric starter		kickstarter	kick - electric starter	

BASIC CARBURATOR SETTING

	250 EXC RACING	250 EXC RACING 8,3 kW	400 SX RACING 400 MXC/EXC RACING	400 EXC RACING 12 kW 520 EXC RACING 12,5 kW
Type	Keihin CR35	Keihin CR35	Keihin CR39	Keihin CR39
Carburetor-setting number	170401	041200	031299	130799
Main jet	160	160	175	175
Jet needle	OBEVP	OBEVR	OBDTM	OBDVR
Idling jet	48	45	48	48
Main air jet	200	200	200	200
Idling air jet	100	100	100	100
Needle position	6. th from top	6. th from top	4. th from top	3. rd from top
Starting jet	85	85	85	85
Mixture control screw open	1,25	1,0	1	1,25
Slide	15	15	15	15
Performance restrictor	–	Slide stop 24,5 mm	–	Slide stop 24,5 mm
Stop pump membrane	0	0	3,2 mm	3,2 mm

BASIC CARBURATOR SETTING

	520 SX RACING	520 MXC/EXC RACING	400 EXC-Green	520 EXC-Green
Type	Keihin CR39	Keihin CR39	Keihin CR39	Keihin CR39
Carburetor-setting number	250899	100699	250401	240401
Main jet	175	175	175	175
Jet needle	OBDTM	OBDTM	OBDVR	OBDVR
Idling jet	48	48	48	45
Main air jet	200	200	200	200
Idling air jet	100	100	100	100
Needle position	3. rd from top	2. nd from top	6. th from top	3. rd from top
Starting jet	85	85	85	85
Mixture control screw open	1	2,5	1,25	1
Slide	15	15	15	15
Performance restrictor	–	–	–	–
Stop pump membrane	3,2 mm	3,2 mm	3,2 mm	3,2 mm

TECHNICAL DATA – CHASSIS 250/400/520 SX, MXC, EXC RACING 2002

	400/520 SX RACING	250/400/520 EXC RACING	400/520 MXC, EXC USA
Frame	Central tube chrome-moly-steel frame		
Fork	WP USD 4860 MXMA	WP Up Side Down 4357 MXMA	
Wheel travel front/rear	295/320 mm		
Rear suspension	WP Progressive Damping System shock absorber, aluminium swing arm		
Front brake	Disk brake with carbon-steel brake disc Ø 260 mm (10.2 in), brake caliper floated		
Rear brake	Disk brake with carbon-steel brake disc Ø 220 mm (8.7 in), brake caliper floated		
Brake disc	Wear limit max. 0,4 mm (0,016 in)		
Front tires	80/100 - 21"	90/90 - 21"	80/100 - 21"
Air pressure offroad	1.0 bar (14 psi)	1.0 bar (14 psi)	1.0 bar (14 psi)
Air pressure road driver only	–	1.5 bar	1.5 bar (21 psi)
Rear tires	110/90 - 19"	140/80 - 18"	110/100 - 18"
Air pressure offroad	1.0 bar (14 psi)	1.0 bar (14 psi)	1.0 bar (14 psi)
Air pressure road driver only	–	2.0 bar (28 psi)	2.0 bar (28 psi)
Fuel tank capacity	7.5 liters (2 US gallons)	EXC 8.5 liters (2.1 US gallons)	MXC 13 Liter (3.5 gallons)
Final drive ratio	400-14:50t / 520-14:48t	250-12:52t / 400-15:45t / 520-15:40t	400-14:50t / 520-14:48t
Chain	O-Ring 5/8 x 1/4 "		
Available final sprockets	38t, 40t, 42t, 45t, 48t, 50t, 52t		
Bulbs	headlight	HS1 12V 35/35W	
	parking light	12V 5W (Socket W2, 1x9,5d)	
	instrument lights	12V 1,2W (Socket W2, 1x4,6d)	
	brake - rear light	12V 21/5W (Socket BaY15d)	
	flasher light	12V 10W (Socket Ba15s)	
	license plate illumination	12V 1,2W (Socket 1x4,6d)	
Battery	maintenance-free battery 12V 8Ah		
Steering head angle	63.5°		
Wheel base	1481 ± 10 mm (58.3 ± 0.4 in)		
Seat height, unloaded	925 mm (36.5 in)		
Ground clearance, unloaded	380 mm (15.1 in)		
Dead-weight *	107 kg (236 lbs)	112 kg (247 lbs)	

* Dead-weight without fuel

STANDARD ADJUSTMENT-FORK

	WP 1418W710	WP 0518W712
Compression adjuster	20	20
Rebound adjuster	16	12
Spring	4.4 N/mm	4.2 N/mm
Spring preload	5 mm	5 mm
Air chamber length	100 mm	130 mm
Fork oil	SAE 5	SAE 5

STANDARD ADJUSTMENT - SHOCK ABSORBER

	WP 5018 PDS DCC 1218W738	WP 5018 PDS MCC 1218W739
Compression adjuster	15 LS (Low speed) 2 HS (high speed)	15
Rebound adjuster	25	25
Spring	PDS7-260	PDS6-260
Spring preload	4 mm	5 mm

TECHNICAL DATA – ENGINE 250/450/525 SX, MXC, EXC RACING 2003

Type	250 EXC	450 SX	450 MXC	450 EXC	525 SX	525 MXC	525 EXC
Design	Liquid-cooled single cylinder 4-stroke engine with balancer shaft						
Displacement	250 cc	449 cc	448 cc		510 cc		
Bore/Stroke	75 / 56.5 mm	95 / 63.4 mm	89 / 72 mm		95 / 72 mm		
Ratio	12 : 1		11 : 1				
Fuel	unleaded premium gasoline with at least RON 95						
Valve timing	4 valves over rocker arm and 1 overhead camshaft, camshaft drive through single chain						
Camshaft	5532	594/55	590/5521		8/06	590/5521	
Valve diameter Intake	28 mm	35 mm (Titan)	35 mm				
Valve diameter Exhaust	24 mm	30 mm (Titan)	30 mm				
Valve clearance cold Intake	0.12 mm (0.0047 in)						
Valve clearance cold Exhaust	0.12 mm (0.0047 in)						
Crank shaft bearing	2 cylinder roller bearing						
Connecting rod bearing	needle bearing						
Top end bearing	bronze bushing						
Piston	alluminium alloy cast				alluminium alloy forged		
Piston rings	1 compression ring, 1 oil scraper ring						
Engine lubrication	pressure circulation lubrication with two rotor pumps						
Engine oil	full synthetic oil (Shell Advance Ultra 4 SAE 10W40)						
Quantity of engine oil	1.25 liters						
Primary ratio	straight geared spur wheels 33:76 Z						
Clutch	multi disc clutch in oil bath						
Transmission claw shifted	6-speed	4-speed	6-speed	6-speed	4-speed	6-speed	6-speed
Gear ratio							
1 st Gear	14:38	16:32	16:32	14:34	16:32	16:32	14:34
2 nd Gear	16:36	18:30	18:30	17:31	18:30	18:30	17:31
3 rd Gear	19:34	20:28	20:28	19:28	20:28	20:28	19:28
4 th Gear	21:32	22:26	22:26	22:26	22:26	22:26	22:26
5 th Gear	23:30	-	24:24	24:23	-	24:24	24:23
6 th Gear	22:25	-	21:18	26:21	-	21:18	26:21
Ignition system	contactless DC-CDI ignition with digital advanced system by KOKUSAN						
Generator	12V 150W	12V 40W	12V 150W		12V 40W	12V 150W	
Spark plug	NGK DCPR 8 E						
Spark plug gap	0.6 mm (0.02367 in)						
Cooling system	liquid cooled, permanent rotation of cooling liquid through mechanically driven water pump						
Cooling liquid	1 liter, 40% antifreeze, 60% water, at least -25° (-13° F)						
Starting equipment	kick-electric starter	kickstarter	kick - electric starter		kickstarter	kick - electric starter	

BASIC CARBURATOR SETTING

	250 EXC RACING Six Days	250 EXC RACING 11 kW	450 EXC RACING 12 kW	450 SX RACING
Type	Keihin FCR-MX 37	Keihin FCR-MX 37	Keihin FCR-MX 39	Keihin FCR-MX 41
Carburator-setting number	3700A	3700A	3900A	4122A
Main jet	160	160	178	185
Jet needle	OBETP	OBEKT	OBDVR	OBFTP
Idling jet	42	42	42	40
Main air jet	200	200	200	200
Idling air jet	100	100	100	100
Needle position	3. rd from top	3. rd from top	3. rd from top	4. rd from top
Starting jet	85	85	85	85
Mixture control screw open	1,25	0,75	1,25	1
Slide	15	15	15	15
Performance restrictor	–	Slide stop	Slide stop	–
Stop pump membrane	858 / 2,15 mm	858 / 2,15 mm	858 / 2,15 mm	858 / 2,15 mm
Hot start device	–	–	–	2,2 mm

BASIC CARBURATOR SETTING

	525 EXC RACING Six Days	525 EXC RACING 525 MXC RACING 12 kW	525 SX RACING
Type	Keihin FCR-MX 39	Keihin FCR-MX 39	Keihin FCR-MX 41
Carburator-setting number	3900A	3900B	4125A
Main jet	178	178	185
Jet needle	OBFTN	OBFTV	OBFTP
Idling jet	42	42	42
Main air jet	200	200	200
Idling air jet	100	100	100
Needle position	2. rd from top	3. rd from top	4. rd from top
Starting jet	85	85	85
Mixture control screw open	1,5	1,25	1,5
Slide	15	15	15
Performance restrictor	–	Slide stop	–
Stop pump membrane	858 / 2,15 mm	858 / 2,15 mm	858 / 2,15 mm
Hot start device	–	–	2,5 mm

TECHNICAL DATA – CHASSIS 250/450/525 SX, MXC, EXC RACING 2003

	450/525 SX RACING	250/450/525 EXC RACING	450/525 MXC, EXC USA
Frame	Central tube chrome-moly-steel frame		
Fork	WP Up Side Down 4860 MXMA		
Wheel travel front/rear	300/335 mm		
Rear suspension	WP Progressive Damping System shock absorber, aluminium swing arm		
Front brake	Disk brake with carbon-steel brake disc Ø 260 mm (10.2 in), brake caliper floated		
Rear brake	Disk brake with carbon-steel brake disc Ø 220 mm (8.7 in), brake caliper floated		
Brake disc	Wear limit max. 0,4 mm (0,016 in)		
Front tires	80/100 - 21"	90/90 - 21"	80/100 - 21"
Air pressure offroad	1.0 bar (14 psi)	1.0 bar (14 psi)	1.0 bar (14 psi)
Air pressure road driver only	–	1.5 bar	1.5 bar (21 psi)
Rear tires	110/90 - 19"	140/80 - 18"	110/100 - 18"
Air pressure offroad	1.0 bar (14 psi)	1.0 bar (14 psi)	1.0 bar (14 psi)
Air pressure road driver only	–	2.0 bar (28 psi)	2.0 bar (28 psi)
Fuel tank capacity	7 liters (2 US gallons)	EXC 8 liters (2.1 US gallons)	MXC 13 Liter (3.5 gallons)
Final drive ratio	450-14:50t / 525-14:48t	250-12:52t / 450-15:45t / 525-15:40t	450-14:50t / 525-14:48t
Chain	X-Ring 5/8 x 1/4 "		
Available final sprockets	38t, 40t, 42t, 45t, 48t, 50t, 52t		
Bulbs	headlight	HS1 12V 35/35W	
	parking light	12V 5W (Socket W2, 1x9,5d)	
	brake - rear light	12V 21/5W (Socket BaY15d)	
	flasher light	12V 10W (Socket Ba15s)	
	license plate illumination	12V 1,2W (Socket 1x4,6d)	
Battery	maintenance-free battery 12V 8Ah		
Steering head angle	63.5°		
Wheel base	1481 ± 10 mm (58.3 ± 0.4 in)		
Seat height, unloaded	925 mm (36.5 in)		
Ground clearance, unloaded	380 mm (15.1 in)		

STANDARD ADJUSTMENT - FORK

	WP4860MXMA 1418X727	WP4860MXMA 1418X737
Compression adjuster	18	21
Rebound adjuster	19	20
Spring	4.4 N/mm	4.2 N/mm
Spring preload	5 mm (0.20 in)	5 mm (0.20 in)
Air chamber length	90 mm (3.6 in)	110 mm (4.4 in)
Fork oil	SAE 5	SAE 5

STANDARD ADJUSTMENT-SHOCK ABSORBER

	WP 5018 PDS DCC 1218X760	WP 5018 PDS MCC 1218X761
Compression adjuster	15 LS (low speed) 2 HS (high speed)	17
Rebound adjuster	26	26
Spring	76-95/260	71-90/260
Spring preload	6 mm (0.24 in)	8 mm (0.32 in)

TECHNICAL DATA – ENGINE 250/450/525 SX, MXC, EXC RACING 2004

Type	250 EXC	450 SX	450 MXC	450 EXC	525 SX	525 MXC-G USA	525 EXC 525 MXC Desert
Design	Liquid-cooled single cylinder 4-stroke engine with balancer shaft						
Displacement	250 cc	449 cc	448 cc		510 cc		
Bore/Stroke	75 / 56.5 mm	95 / 63.4 mm	89 / 72 mm		95 / 72 mm		
Ratio	12:1		11:1				
Fuel	unleaded fuel with at least RON 95 (USA = Premium RON 91)						
Valve timing	4 valves over rocker arm and 1 overhead camshaft, camshaft drive through single chain						
Camshaft	5532	590/5521	590/5521		55/21	590/5521	
Valve diameter Intake	28 mm	35 mm (Titan)	35 mm				
Valve diameter Exhaust	24 mm	30 mm (Titan)	30 mm				
Valve clearance cold Intake	0.12 mm (0.0047 in)						
Valve clearance cold Exhaust	0.12 mm (0.0047 in)						
Crank shaft bearing	2 cylinder roller bearing						
Connecting rod bearing	needle bearing						
Top end bearing	bronze bushing						
Piston alluminium alloy -	cast	forged	cast		forged		
Piston rings	1 compression ring, 1 oil scraper ring						
Engine lubrication	pressure circulation lubrication with two rotor pumps						
Engine oil	full synthetic oil (Motorex Power Synt 4T 10W/50)						
Quantity of engine oil	1.25 liters						
Primary ratio	straight geared spur wheels 33:76 Z						
Clutch	multi disc clutch in oil bath						
Transmission claw shifted	6-speed	4-speed	6-speed	6-speed	4-speed	6-speed	6-speed
Gear ratio							
1 st Gear	14:38	16:32	16:32	14:34	16:32	16:32	14:34
2 nd Gear	16:36	18:30	18:30	17:31	18:30	18:30	17:31
3 rd Gear	19:34	20:28	20:28	19:28	20:28	20:28	19:28
4 th Gear	21:32	22:26	22:26	22:26	22:26	22:26	22:26
5 th Gear	23:30	-	24:24	24:23	-	24:24	24:23
6 th Gear	22:25	-	21:18	26:21	-	21:18	26:21
Ignition system	contactless DC-CDI ignition with digital advanced system by KOKUSAN						
Generator	12V 150W	-	12V 150W		-	12V 150W	
Spark plug	NGK DCPR 8 E						
Spark plug gap	0.6 mm (0.02367 in)						
Cooling system	liquid cooled, permanent rotation of cooling liquid through mechanically driven water pump						
Cooling liquid	1 liter, 40% antifreeze, 60% water, at least -25° (-13° F)						
Starting equipment	kick-electric starter	kickstarter	kick - electric starter		kickstarter	kick - electric starter	

BASIC CARBURATOR SETTING

	250 EXC RACING Six Days	250 EXC RACING 11 kW	250 EXC-G USA	450 EXC RACING Six Days
Type	Keihin FCR-MX 37	Keihin FCR-MX 37	Keihin FCR-MX 37	Keihin FCR-MX 39
Carburetor-setting number	3700A	3700A	3700A	3900A
Main jet	160	160	160	178
Jet needle	OBETP	OBEKT	OBEKT	OBDTN
Idling jet	42	42	42	42
Main air jet	200	200	200	200
Idling air jet	100	100	100	100
Needle position	3. rd from top	3. rd from top	3. rd from top	2. rd from top
Starting jet	85	85	85	85
Mixture control screw open	1.25	0.75	0.75	1.5
Slide	15	15	15	15
Performance restrictor	–	Slide stop	–	–
Stop pump membrane	858 / 2.15 mm	858 / 2.15 mm	858 / 2.15 mm	858 / 2.15 mm
Hot start device	–	–	–	–

BASIC CARBURATOR SETTING

	450 EXC RACING 12 kW	450 EXC-G 450 MXC-G USA	450 SX RACING	525 EXC RACING Six Days
Type	Keihin FCR-MX 39	Keihin FCR-MX 39	Keihin FCR-MX 41	Keihin FCR-MX 39
Carburetor-setting number	3900A	3900A	4122A	3900B
Main jet	178	178	185	178
Jet needle	OBDVR	OBDVR	OBDTP	OBDTN
Idling jet	42	42	40	42
Main air jet	200	200	200	200
Idling air jet	100	100	100	100
Needle position	3. rd from top	3. rd from top	4. rd from top	2. rd from top
Starting jet	85	85	85	85
Mixture control screw open	1.25	1.25	1.0	1.5
Slide	15	15	15	15
Performance restrictor	Slide stop	–	–	–
Stop pump membrane	858 / 2.15 mm	858 / 2.15 mm	858 / 2.15 mm	858 / 2.15 mm
Hot start device	–	–	2.2 mm	–

BASIC CARBURATOR SETTING

	525 EXC RACING 525 MXC Desert 12 kW	525 EXC-G 525 MXC-G USA	525 SX RACING
Type	Keihin FCR-MX 39	Keihin FCR-MX 39	Keihin FCR-MX 41
Carburetor-setting number	3900B	3900B	4125A
Main jet	178	178	185
Jet needle	OB DVT	OB DVT	OB DTP
Idling jet	42	42	42
Main air jet	200	200	200
Idling air jet	100	100	100
Needle position	3. rd from top	3. rd from top	4. rd from top
Starting jet	85	85	85
Mixture control screw open	1.25	1.25	1.5
Slide	15	15	15
Performance restrictor	Slide stop	–	–
Stop pump membrane	858 / 2.15 mm	858 / 2.15 mm	858 / 2.15 mm
Hot start device	–	–	2.5 mm

TECHNICAL DATA - ENGINE 400 EXC, 450/525 SMR, 450/540 SXS RACING 2004

TYPE	400 EXC	450 SMR	525 SMR	450 SXS	540 SXS
Design	Liquid-cooled single cylinder 4-stroke engine with balancer shaft				
Displacement	398 cm³	450 cm³	510 cm³	449 cm³	534 cm³
Bore/Stroke	89/64 mm	95/63,4 mm	95/72 mm	95/63,4 mm	100/68 mm
Ratio	12 : 1		11:1	12:1	
Fuel	unleaded fuel with at least RON 95 (USA = Premium RON 91)				
Valve timing	4 valves over rocker arm and 1 overhead camshaft, camshaft drive through single chain				
Camshaft	595/0121	590/5521	590/5521	55/21	8/06
Valve diameter Intake	35 mm	35 mm (Titan)			
Valve diameter Exhaust	30 mm	30 mm (Titan)			
Valve clearance cold Intake	0,12 mm				
Valve clearance cold Exhaust	0,12 mm				
Crank shaft bearing	2 cylinder roller bearing				
Connecting rod bearing	needle bearing				
Top end bearing	bronze bushing				
Piston alluminium alloy -	bronze bushing	forged			
Piston rings	1 compression ring, 1 oil scraper ring				
Engine lubrication	pressure circulation lubrication with two rotor pumps				
Engine oil	full synthetic oil (Motorex Power Synt 4T 10W/50)				
Quantity of engine oil	1,25 Liter				
Primary ratio	straight geared spur wheels 33:76				
Clutch	Mehrscheibenkupplung im Ölbad				
Transmission claw shifted	6-speed	6-speed		6-speed	4-speed
Gear ratio					
1st Gear	14:34	16:32		16:32	16:32
2nd Gear	17:31	18:30		16:28	18:30
3rd Gear	19:28	20:28		21:32	20:28
4th Gear	22:26	22:26		22:29	22:26
5th Gear	24:23	24:24		23:26	--
6th Gear	26:21	21:18		21:18	--
Ignition system	contactless DC-CDI ignition with digital advanced system by KOKUSAN				
Generator	12V 150W	12V 40W			
Spark plug	NGK DCPR 8 E				
Spark plug gap	0,6 mm				
Cooling system	liquid cooled, permanent rotation of cooling liquid through mechanically driven water pump				
Cooling liquid	1 liter, 50% antifreeze, 50% water, at least -25°				
Starting equipment	kick - electric starter	kickstarter			

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BASIC CARBURATOR SETTING

	400 EXC RACING 12 kW	450 SMR	525 SMR	450 SXS	540 SXS
Type	Keihin FCR-MX 39	Keihin FCR-MX 41	Keihin FCR-MX 41	Keihin FCR-MX 41	Keihin FCR-MX 41
Main jet	178	185	185	185	190
Jet needle	OBDVR	OBDTP	OBDTP	OBDTP	OBDTP
Idling jet	42	40	42	40	42
Main air jet	200	200	200	200	200
Idling air jet	100	100	100	100	100
Needle position	1 st from top	4 th from top	4 th from top	4 th from top	4. von oben
Starting jet	85	85	85	85	85
Mixture control screw open	1,25	1	1,5	1	1,5
Slide	15	15	15	15	15
Performance restrictor	slide stop	--	--	--	--
Stop pump membrane	858 / 2,15 mm	858 / 2,15 mm	858 / 2,15 mm	858 / 2,15 mm	858 / 2,15 mm
Hot start device	–	2,2 mm	2,5 mm	2,2 mm	2,5 mm

TECHNICAL DATA – CHASSIS 250/450/525 SX, MXC, EXC RACING 2004

	450/525 SX	250/450/525 EXC, MXC Desert EU	450/525 MXC-G, EXC-G USA
Frame	Central tube chrome-moly-steel frame		
Fork	WP Up Side Down 4860 MXMA		
Wheel travel front/rear	300/335 mm		
Rear suspension	WP Progressive Damping System shock absorber, aluminium swing arm		
Front brake	Disk brake with carbon-steel brake disc Ø 260 mm (10.2 in), brake caliper floated		
Rear brake	Disk brake with carbon-steel brake disc Ø 220 mm (8.7 in), brake caliper floated		
Brake disc	Wear limit max. 0,4 mm (0,016 in)		
Front tires	80/100 - 21 "	90/90 - 21 "	80/100 - 21 "
Air pressure offroad	1.0 bar (14 psi)	1.0 bar (14 psi)	1.0 bar (14 psi)
Air pressure road driver only	–	1.5 bar	1.5 bar (21 psi)
Rear tires	110/90 - 19"	140/80 - 18"	110/100 - 18"
Air pressure offroad	1.0 bar (14 psi)	1.0 bar (14 psi)	1.0 bar (14 psi)
Air pressure road driver only	–	2.0 bar (28 psi)	2.0 bar (28 psi)
Fuel tank capacity	7 liters (2 US gallons)	EXC 8,5 liters (2.1 US gallons)	MXC 13 Liter (3.5 gallons)
Final drive ratio	450-14:52t / 525-14:48t	250-15:45t / 450-15:45t / 525-15:45t	450-14:50t / 525-14:48t
Chain	X-Ring 5/8 x 1/4 "		
Available final sprockets	38t, 40t, 42t, 45t, 48t, 50t, 52t		
Bulbs	headlight	HS1 12V 35/35W	
	parking light	12V 5W (Sockel W2, 1x9,5d)	
	brake - rear light	12V 21/5W (Sockel BaY15d)	
	flasher light	12V 10W (Sockel Ba15s)	
	license plate illumination	12V 1,2W (Sockel 1x4,6d)	
Battery	maintenance-free battery 12V 8Ah		
Steering head angle	63.5°		
Wheel base	1481 ± 10 mm (58.3 ± 0.4 in)		
Seat height, unloaded	925 mm (36.5 in)		
Ground clearance, unloaded	380 mm (15.1 in)		

STANDARD ADJUSTMENT - FORK

	WP4860MXMA 1418Y747	WP4860MXMA 1418Y748
Compression adjuster	18	20
Rebound adjuster	19	20
Spring	4.6N/mm	4.2 N/mm
Spring preload	5 mm (0.20 in)	5 mm (0.20 in)
Air chamber length	100 mm (3.9 in)	120 mm (4.7 in)
Fork oil	SAE 5	SAE 5

STANDARD ADJUSTMENT-SHOCK ABSORBER

	WP 5018 PDS DCC 1218Y771	WP 5018 PDS MCC 1218Y772
Compression adjuster	12 LS (low speed) 2 HS (high speed)	19
Rebound adjuster	22	24
Spring	88/250	88/250
Spring preload	5 mm (0.2 in)	6 mm (0.24 in)

TECHNICAL DATA - CHASIS 400 EXC, 450/525 SMR, 450/540 SXS RACING 2004

CHASIS	400 EXC	450/525 SMR	450/540 SXS
Frame	Central tube chrome-moly-steel frame		
Fork	4860 PA/MA	WP Up Side Down 4860 MA	
Wheel travel front/rear	300/335 mm	285/300 mm	300/335 mm
Rear suspension	WP Progressive Damping System shock absorber, aluminium swing arm		
Front brake	Disk brake with carbon-steel brake disc, brake caliper floated		
	Ø 260 mm	Ø 310 mm	Ø 260 mm
Rear brake	Disk brake with carbon-steel brake disc, brake caliper floated		
	Ø 220 mm		
Brake disc	Wear limit max. 2,5 mm front and 3,5 mm rear		
Front tires	90/90 - 21"	120/75 R 17 KR 106	80/100 - 21"
Air pressure offroad	1,0 bar	--	1,0 bar
Air pressure road driver only	1,5 bar	1,5 bar	--
Rear tires	140/80 - 18"	165/55 R 17 KR 108	110/90 - 19"
Air pressure offroad	1,0 bar	--	1,0 bar
Air pressure road driver only	2,0 bar	1,6 bar	--
Fuel tank capacity	8,5 Liter	7,0 Liter	
Final drive ratio	15:45	14:45	450-14:52 / 525-14:48
Chain	X-Ring 5/8 x 1/4 "		
Available final sprockets	38Z, 40Z, 42Z, 45Z, 48Z, 50Z, 52Z		
Bulbs	headlight HS1 12V 35/35W parking light 12V 5W (Sockel W2, 1x9,5d) brake - rear light 12V 21/5W (Sockel BaY15d) flasher light 12V 10W (Sockel Ba15s) license plate illumination 12V 1,2W (Sockel 1x4,6d)	--	--
Battery	maintenance-free battery 12V 8Ah	--	--
Steering head angle	63,5°		
Wheel base	1481 ± 10 mm		
Seat height, unloaded	925 mm	855 mm	925 mm

STANDARD ADJUSTMENT - FORK			
	400 EXC	450/525 SMR	450/540 SXS
	WP4860MA 1418Y748	WP4860MXMA 1418Y767	WP4860MXMA 1418Y762
Compression adjuster	20	19	18
Rebound adjuster	20	12	20
Spring	4,2 N/mm	4,6 N/mm	4,4 N/mm
Spring preload	5 mm	5 mm	513* mm
Air chamber length	120 mm	100 mm	110 mm
Fork oil	SAE 5	SAE 5	SAE 5

*Total length including pretension spacer

STANDARD ADJUSTMENT-SHOCK ABSORBER			
	400 EXC	450/525 SMR	450/540 SXS
	WP 5018 PDS MCC 1218Y772	WP 5018 PDS DCC 1218Y787	WP 5018 PDS BAVP 12187A06
Compression adjuster	19	13 LS (low speed) 2 HS (high speed)	15 LS (low speed) 2 HS (high speed)
Rebound adjuster	24	19	22
Spring	88/250	92/250	87,5/240
Spring preload	6 mm	8 mm	5 mm

TECHNICAL DATA - ENGINE 250/400/450/525 SX,MXC,EXC RACING 2005

TYPE	250 EXC	400 EXC	450 SX	450 MXC	450 EXC	525 SX	525 MXC-G	525 EXC 525 MXC DESERT
Design	Liquid-cooled single cylinder 4-stroke engine with balancer shaft							
Displacement	250 cm³	398 cm³	449 cm³	448 cm³		510 cm³		
Bore/Stroke	75/56,5 mm	89 / 64 mm	95/63,4 mm	89 / 72 mm		95 / 72 mm		
Ratio	12 : 1			11 : 1				
Fuel	unleaded fuel with at least RON 95 (USA = Premium RON 91)							
Valve timing	4 valves over rocker arm and 1 overhead camshaft, camshaft drive through single chain							
Camshaft	5532	595/0121	590/5521	590/5521		55/21	590/5521	
Valve diameter Intake	28 mm	35 mm	35 mm (Titan)	35 mm				
Valve diameter Exhaust	24 mm	30 mm	30 mm (Titan)	30 mm				
Valve clearance cold Intake	0.12 mm (0.0047 in)							
Valve clearance cold Exhaust	0.12 mm (0.0047 in)							
Crank shaft bearing	2 cylinder roller bearing							
Connecting rod bearing	needle bearing							
Top end bearing	bronze bushing							
Piston alluminium alloy -	cast		forged	cast		forged		
Piston rings	1 compression ring, 1 oil scraper ring							
Engine lubrication	pressure circulation lubrication with two rotor pumps							
Engine oil	full synthetic oil (Motorex Power Synt 4T 10W/50)							
Quantity of engine oil	1.25 liters							
Primary ratio	straight geared spur wheels 33:76 Z							
Clutch	multi disc clutch in oil bath							
Transmission claw shifted	6-speed	6-speed	4-speed	6-speed	6-speed	4-speed	6-speed	6-speed
Gear ratio 1st Gear	14:38	14:34	16:32	16:32	14:34	16:32	16:32	14:34
2nd Gear	16:36	17:31	18:30	18:30	17:31	18:30	18:30	17:31
3rd Gear	19:34	19:28	20:28	20:28	19:28	20:28	20:28	19:28
4th Gear	21:32	22:26	22:26	22:26	22:26	22:26	22:26	22:26
5th Gear	23:30	24:23	-	24:24	24:23	-	24:24	24:23
6th Gear	22:25	26:21	-	21:18	26:21	-	21:18	26:21
Ignition system	contactless DC-CDI ignition with digital advanced system by KOKUSAN							
Generator	12V 150W		-	12V 150W		-	12V 150W	
Spark plug	NGK DCPR 8 E							
Spark plug gap	0.6 mm (0.02367 in)							
Cooling system	liquid cooled, permanent rotation of cooling liquid through mechanically driven water pump							
Cooling liquid	1 liter, 40% antifreeze, 60% water, at least -25° (-13° F)							
Starting equipment	kick - electric starter		kickstarter	kick - electric starter		kickstarter	kick - electric starter	

BASIC CARBURATOR SETTING

	250 EXC RACING EU / AUS 11 kW	400 EXC RACING EU / AUS 12 kW	400 EXC-G RACING USA	450 EXC RACING EU / AUS 12 kW
Type	Keihin FCR-MX 3700A	Keihin FCR-MX 3900C	Keihin FCR-MX 3900C	Keihin FCR-MX 3900A
Main jet	160	178	178	178
Jet needle	OBEKT	OBDVR	OBDVR	OBDVR
Idling jet	42	42	42	42
Main air jet	200	200	200	200
Idling air jet	100	100	100	100
Needle position	3 rd from top	1 st from top	1 st from top	3 rd from top
Starting jet	85	85	85	85
Mixture control screw open	0,75	1,25	1,25	1,25
Slide	15	15	15	15
Performance restrictor	Slide stop	Slide stop	–	Slide stop
Stop pump membrane	858 / 2,15 mm	858 / 2,15 mm	858 / 2,15 mm	858 / 2,15 mm
Hot start device	–	–	–	–

BASIC CARBURATOR SETTING

	450 EXC-G / MXC-G RACING USA	450 EXC RACING SIXDAYS	450 SX/SXS RACING	525 EXC / MXC RACING / DESERT RACING EU / AUS 12 kW
Type	Keihin FCR-MX 3900A	Keihin FCR-MX 3900A	Keihin FCR-MX 4122A	Keihin FCR-MX 3900B
Main jet	178	178	185	178
Jet needle	OBDVR	OBDTR	OBDTP	OBDVT
Idling jet	42	42	40	42
Main air jet	200	200	200	200
Idling air jet	100	100	100	100
Needle position	3 rd from top	4 th from top	4 th from top	3 rd from top
Starting jet	85	85	85	85
Mixture control screw open	1,25	2,0	1,0	1,25
Slide	15	15	15	15
Performance restrictor	–	–	–	Slide stop
Stop pump membrane	858 / 2,15 mm	858 / 2,15 mm	858 / 2,15 mm	858 / 2,15 mm
Hot start device	–	–	2,2 mm	–

BASIC CARBURATOR SETTING

	525 MXC-G / EXC-G RACING USA	525 EXC RACING SIXDAYS	525 SX RACING
Type	Keihin FCR-MX 3900B	Keihin FCR-MX 3900B	Keihin FCR-MX 4125A
Main jet	178	178	185
Jet needle	OBDVT	OBDTR	OBDTP
Idling jet	42	42	42
Main air jet	200	200	200
Idling air jet	100	100	100
Needle position	3 rd from top	5 th from top	4 th from top
Starting jet	85	85	85
Mixture control screw open	1,25	2,0	1,5
Slide	15	15	15
Performance restrictor	–	–	–
Stop pump membrane	858 / 2,15 mm	858 / 2,15 mm	858 / 2,15 mm
Hot start device	–	–	2,5 mm

TECHNICAL DATA - ENGINE 450/525 SMR, 540 SXS, 610 CRATE RACING 2005

TYPE	450 SMR	525 SMR	450 SXS	540 SXS	610 CRATE
Design	Liquid-cooled single cylinder 4-stroke engine with balancer shaft				
Displacement	449,4 cm³	449,4 cm³	449,4 cm³	533,8 cm³	612,3 cm³
Bore/Stroke	95/63,4 mm	95/72 mm	95/63,4 mm	100/68 mm	100/78 mm
Ratio	12 : 1	11:1	12 : 1	11,5:1	11,85:1
Fuel	unleaded fuel with at least RON 95 (USA = Premium RON 91)		unleaded fuel with at least RON 98		
Valve timing	4 valves over rocker arm and 1 overhead camshaft, camshaft drive through single chain				
Camshaft	590/5521		55/21	8/06	8/07
Valve diameter Intake	35 mm (Titan)				
Valve diameter Exhaust	30 mm (Titan)				
Valve clearance cold Intake	0,12 mm				
Valve clearance cold Exhaust	0,12 mm				
Crank shaft bearing	2 cylinder roller bearing				cylinder roller-/ball bearing
Connecting rod bearing	needle bearing				
Top end bearing	bronze bushing				
Piston alluminium alloy -	forged				
Piston rings	1 compression ring, 1 oil scraper ring				
Engine lubrication	pressure circulation lubrication with two rotor pumps				
Engine oil	full synthetic oil (Motorex Power Synt 4T 10W/50)				
Quantity of engine oil	1,25 liters				
Primary ratio	straight geared spur wheels 33:76				
Clutch	multi disc clutch in oil bath				
Transmission claw shifted	6-speed		6-speed	4-speed	6-speed
Gear ratio					
1st Gear	16:32		16:32	16:32	16:32
2nd Gear	18:30		16:28	18:30	18:30
3rd Gear	20:28		21:32	20:28	20:28
4th Gear	22:26		22:29	22:26	22:26
5th Gear	24:24		23:26	--	24:24
6th Gear	21:18		21:18	--	21:18
Ignition system	contactless DC-CDI ignition with digital advanced system by KOKUSAN				
Generator	12 V 40 W				
Spark plug	NGK DCPR 8 E				
Spark plug gap	0,6 mm				
Cooling system	liquid cooled, permanent rotation of cooling liquid through mechanically driven water pump				
Cooling liquid	1 liter, 50% antifreeze, 50% water, at least -25°				
Starting equipment	kickstarter				

BASIC CARBURATOR SETTING				
	450 SMR	525 SMR	540 SXS	610 CRATE
Type	Keihin FCR-MX 4122A	Keihin FCR-MX 4125A	Keihin FCR-MX 4122A	Keihin FCR-MX 4122A
Main jet	185	185	185	190
Jet needle	OBDTP	OBDTP	OBDTP	OBDTP
Idling jet	40	42	42	45
Main air jet	200	200	200	200
Idling air jet	100	100	100	100
Needle position	4 th from top	4 th from top	4 th from top	4 th from top
Starting jet	85	85	85	85
Mixture control screw open	1,0	1,5	1,0	1,5
Slide	15	15	15	15
Performance restrictor	–	–	–	–
Stop pump membrane	858 / 2,15 mm	858 / 2,15 mm	858 / 2,15 mm	858 / 2,15 mm
Hot start device	2,2 mm	2,5 mm	2,2 mm	2,2 mm

TECHNICAL DATA - CHASIS 250/400/450/525 SX, MXC, EXC RACING 2005

CHASSIS	450/525 SX	250/400/450/525 EXC/MXC DESERT	450/525 MXC-G, EXC-G USA
Frame	Central tube chrome-moly-steel frame		
Fork	4860 PA/MA	WP Up Side Down 4860 MA	
Wheel travel front/rear	300/335 mm		
Rear suspension	WP Progressive Damping System shock absorber, aluminium swing arm		
Front brake	Disk brake with carbon-steel brake disc Ø 260 mm (10.2 in), brake caliper floated		
Rear brake	Disk brake with carbon-steel brake disc Ø 220 mm (8.7 in), brake caliper floated		
Brake disc	Wear limit max. 2,5 mm front and 3,5 mm rear		
Front tires Air pressure offroad Air pressure road driver only	80/100 - 21“ 1.0 bar (14 psi) –	90/90 - 21“ 1.0 bar (14 psi) 1,5 bar	80/100 - 21“ 1.0 bar (14 psi) 1.5 bar (21 psi)
Rear tires Air pressure offroad Air pressure road driver only	110/90 - 19“ 1.0 bar (14 psi) –	140/80 - 18“ 1.0 bar (14 psi) 2.0 bar (28 psi)	110/100 - 18“ 1.0 bar (14 psi) 2.0 bar (28 psi)
Fuel tank capacity	7 liters (2 US gallons)	EXC 8,5 liters (2.1 US gallons) MXC 13 Liter (3.5 gallons)	
Final drive ratio	450-14:52Z / 525-14:48Z	250-15:45Z / 450-15:45Z / 525-15:45Z	450-14:50Z / 525-14:48Z
Chain	X-Ring 5/8 x 1/4 "		
Available final sprockets	38Z, 40Z, 42Z, 45Z, 48Z, 50Z, 52Z		
Bulbs	headlight	12V 35/35W (Socket BA20D)	
	parking light	12V 5W (Socket W2, 1x9,5d)	
	brake - rear light	12V 21/5W (Socket BaY15d)	
	flasher light	12V 10W (Socket Ba15s)	
	license plate illumination	12V 1,2W (Socket 1x4,6d)	
Battery	maintenance-free battery 12V 8Ah		
Steering head angle	63,5°		
Wheel base	1481 ± 10 mm (58.3 ± 0.4 in)		
Seat height, unloaded	925 mm (36.5 in)		
Ground clearance, unloaded	380 mm (15.1 in)		

STANDARD ADJUSTMENT - FORK		
	SX	MXC, MXC Desert, EXC, EXC-G
	WP4860PA/MA 14187A05	WP4860MA 14187A06
Compression adjuster	22	20
Rebound adjuster	20	20
Spring	4,6 N/mm	4,2 N/mm
Spring preload	5 mm	5 mm
Air chamber length	100 mm	110 mm
Fork oil	SAE 5	SAE 5

STANADARD ADJUSTMENT-SHOCK ABSORBER		
	SX	MXC, MXC Desert, EXC, EXC-G
	WP 5018 PDS DCC 12187A05	WP 5018 PDS MCC 12187A06
Compression adjuster	15 LS (low speed) 2 HS (high speed)	15
Rebound adjuster	22	22
Spring	88/250	88/250
Spring preload	7 mm	7 mm

TECHNICAL DATA - CHASIS 450/525 SMR, 450/540 SXS RACING 2005

CHASSIS	450/525 SMR	450/540 SXS
Frame	Central tube chrome-moly-steel frame	
Fork	WP Up Side Down 4860 MA	
Wheel travel front/rear	285/300 mm	300/335 mm
Rear suspension	WP Progressive Damping System shock absorber, aluminium swing arm	
Front brake	Disk brake with carbon-steel brake disc, brake caliper floated	
	Ø 310 mm	Ø 260 mm
Rear brake	Disk brake with carbon-steel brake disc, brake caliper floated	
	Ø 220 mm	
Brake disc	Wear limit max. 2,5 mm front and 3,5 mm rear	
Front tires	120/75 R 17 KR 106	80/100 - 21"
Air pressure offroad	--	1,0 bar
Air pressure road driver only	1,5 bar	--
Rear tires	165/55 R 17 KR 108	110/90 - 19"
Air pressure offroad	--	1,0 bar
Air pressure road driver only	1,6 bar	--
Fuel tank capacity	7,0 liters	
Final drive ratio	14:45	450-14:52 / 525-14:48
Chain	X-Ring 5/8 x 1/4 "	
Available final sprockets	38Z, 40Z, 42Z, 45Z, 48Z, 50Z, 52Z	
Steering head angle	63,5°	
Wheel base	1481 ± 10 mm	
Seat height, unloaded	855 mm	925 mm

STANDARD ADJUSTMENT - FORK		
	450/525 SMR	450/540 SXS
	WP4860PAMA 14.18.7A.18	WP4860MXMA 1418Y762
Compression adjuster	19	18
Rebound adjuster	12	20
Spring	4,6 N/mm	4,4 N/mm
Spring preload	20 mm	513* mm
Air chamber length	100 mm	110 mm
Fork oil	SAE 5	SAE 5

*Total length including pretension spacer

STANDARD ADJUSTMENT-SHOCK ABSORBER		
	450/525 SMR	450/540 SXS
	WP 5018 PDS DCC 12.18.7A.15	WP 5018 PDS BAVP 12187A06
Compression adjuster	13 LS (low speed) 2 HS (high speed)	15 LS (low speed) 2 HS (high speed)
Rebound adjuster	19	22
Spring	88/250	87,5/240
Spring preload	8 mm	5 mm

ASSEMBLY CLEARANCE, WEAR LIMIT		
Crankshaft	axial clearance	0.25 - 0.35 mm
	run out of crank stud	max 0.12 mm
	crankshaft webs - measure outer dimension	65 mm ± 0.05 mm
Conrod bearing	radial clearance	max. 0.05 mm
	axial clearance	max. 1.10 mm
Cylinder 250 EXC	bore diameter size I	75.000 - 75.012 mm
	bore diameter size II	75.013 - 75.025 mm
Cylinder 400 SX/MXC/EXC, 450 EXC/MXC	bore diameter size I	89.000 - 89.012 mm
	bore diameter size II	89.013 - 89.025 mm
Cylinder 450 SX/SMR/SXS, 520, 525	bore diameter size I	95.000 - 95.012 mm
	bore diameter size II	95.013 - 95.025 mm
Cylinder 540 SXS, 610 CRATE	bore diameter	100.000 - 100.012 mm
Piston 250 EXC	diameter size I	74.950 - 74.980 mm
	diameter size II	74.960 - 74.990 mm
	assembly clearance size I	0.020 - 0.062 mm
	assembly clearance size II	0.022 - 0.065 mm
	wear limit	0.12 mm
Piston 400 MXC/EXC	diameter size I	88.920 - 88.950 mm
	diameter size II	88.930 - 88.960 mm
	assembly clearance size I	0.050 - 0.092 mm
	assembly clearance size II	0.052 - 0.095 mm
	wear limit	0.12 mm
Piston 450 EXC/MXC	diameter size I	88.916 - 88.946 mm
	diameter size II	88.926 - 88.958 mm
	assembly clearance size I	0.054 - 0.096 mm
	assembly clearance size II	0.056 - 0.099 mm
	wear limit	0.12 mm
Piston 520 MXC/EXC	diameter size I	94.942 - 94.950 mm
	diameter size II	94.951 - 94.956 mm
	assembly clearance size I	0.060 - 0.070 mm
	assembly clearance size II	0.064 - 0.075 mm
	wear limit	0.12 mm
Piston 450 SX/SMR/SXS	diameter size I	94.932 - 94.960 mm
	diameter size II	94.940 - 94.968 mm
	assembly clearance size I	0.040 - 0.080 mm
	assembly clearance size II	0.044 - 0.085 mm
	wear limit	0.12 mm
Piston 525	diameter size I	94.922 - 94.950 mm
	diameter size II	94.951 - 94.978 mm
	assembly clearance size I	0.050 - 0.090 mm
	assembly clearance size II	0.034 - 0.075 mm
	wear limit	0.12 mm
Piston 540 SXS, 610 CRATE	diameter size I	99.940 - 99.948 mm
	diameter size II	99.950 - 99.958 mm
	assembly clearance	0.060 - 0.090 mm
	wear limit	0.10 mm
Piston ring end gap	compression ring	max. 0.80 mm
	oil scraper ring	max. 1.00 mm

ASSEMBLY CLEARANCE, WEAR LIMIT		
Valves	seat sealing intake	max. 1.50 mm
	seat sealing exhaust	max. 2.00 mm
	spring washer	min. 0.4 mm (new 0.5 mm)
Valve springs 400/520,450/525 EXC/MXC	minimum length of the outer spring	39.20 mm
	minimum length of the inner spring	36.45 mm
Valve springs conical 250 EXC	minimum length	37.70 mm
Valve springs conical 450/525 SX/SMR	minimum length	38.30 mm
Valve springs 450/525 SX/SXS/SMR	minimum length of the outer spring	32.40 mm
	minimum length of the inner spring	30.20 mm
Valve springs 540 SXS, 610 CRATE	minimum length of the outer spring	32.90 mm
	minimum length of the inner spring	30.70 mm
Oil pumps	clearance outer rotor - housing	max. 0.20 mm
	clearance outer rotor - inner rotor	max. 0.20 mm
	axial clearance	0.15 mm
Bypass valve	minimum spring length	23.5 mm
Clutch	length of springs	min. 41.5 mm (new 43 mm)
	wear limit organic up to model 2003	min. 1.70 mm
	wear limit organic from model 2004	min. 1.90 mm
Transmission shafts	axial clearance	0.1 - 0.4 mm
	eccentricity	0.06 mm
Rocker arms	axial clearance	0.02 - 0.10 mm
Balancer shaft	journal eccentricity	0.06 mm

TIGHTENING TORQUES - ENGINE		
Hexagon collar screw, engine case, clutch cover, ignition cover	M6	10 Nm
Oil drain plug	M12x1,5	20 Nm
Allan head plug oil, screen short	M16x1,5	10 Nm
Hexagon plug, oil screen longg	M20x1,5	15 Nm
Collar screw for oil filter cover	M5	6 Nm
Plug pressure valve	M12x1,5	20 Nm
Jet screw and hollow screw, oil line	M8	10 Nm
Oil spraying nozzle	M6x0,75	Loctite 243
Screws, oil pump cover	M5	Loctite 222 + 6 Nm
Hexagon collar screw, cylinder head top section	M6	10 Nm
Hex.collar screw, cylinder head top section, water pump cover	M6	10 Nm
Hexagon collar screw, exhaust flange	M6	Loctite 243 + 10 Nm
Cylinder head screw	M10	40/50 Nm
Hexagon collar screws for cylinder/cylinder head	M6	10 Nm
Allan head screw, camshaft gear	M8	Loctite 243 + 28 Nm
Stop screw, autodecompression (up to model 2003)	M5	Loctite 222 + 8 Nm
Allan head screw, cap rocker arm	M5	6 Nm
Counter nuts, valve adjustment screw	M6x0,75	11 Nm
Allan head screw, primary gear, free wheel	M6	Loctite 648 + 16 Nm
Hexagon nut, primary gear	M20x1,5	Loctite 243 + 150 Nm
Allan head screw, balancer shaft gear	M6	Loctite 243 + 10 Nm
Nut for inner clutch hub	M18x1,5	Loctite 243 + 120 Nm
Hexagon collar screw, clutch spring	M6	Loctite 243 + 8 Nm
Allan head screw, shift roller locking piece	M6	Loctite 243 + 10 Nm
Hexagon collar screw, locking lever	M5	Loctite 243 + 6 Nm
Hexagon collar screw, shift roller	M5	Loctite 243 + 6 Nm
Hexagon collar screw securing guide, chain guide, chain tensioner	M6	Loctite 243 + 6 Nm
Hexagon collar screw, clip	M5	Loctite 243 + 6 Nm
Hexagon collar screw, chain adjuster	M6	10 Nm
Hexagon collar screw, stator MXC/EXC	M6	Loctite 243 + 10 Nm
Hexagon collar screw, stator SX	M5	Loctite 243 + 6 Nm
Hexagon collar screw, pulser coil	M5	Loctite 243 + 6 Nm
Hexagon collar nut, flywheel	M12x1	60 Nm
Hexagon collar screw, bump part kickstarter	M6	Loctite 243 + 10 Nm
Hexagon collar screw, spring hanger kickstarter	M6	Loctite 243 + 10 Nm
Hexagon collar screw, cover E-starter, only SX	M6	Loctite 243 + 10 Nm
Hexagon collar screw, hanger vent hose	M6	Loctite 243 + 10 Nm
Allan head screw, kickstarter	M8	Loctite 243 + 25 Nm
Hexagon collar screw, shift lever	M6	Loctite 243 + 10 Nm
Hexagon screw, engine sprocket	M10	Loctite 243 + 60 Nm
Spark plug	M10	10-12 Nm
Spark plug	M12x1,25	20 Nm
AH bearing bolt for electric starter, kickstarter	M6	Loctite 243 + 10 Nm
Threaded sleeve for cylinder head top section	M20x1,5	Loctite 577
Bleeder flange for housing	M12x1,5	Loctite 243

TIGHTENING TORQUES - CHASSIS

Collar screw, front wheel spindle	M24x1,5	40 Nm
Brake caliper, front	M8	Loctite 243 + 25 Nm
Brake caliper, front radial	M10x1,5	Loctite 243 + 40 Nm
Brake disk, front/rear	M6	Loctite 243 + 10 Nm
Clamping screws, top triple clamp SX/SMR/SXS	M8	15 Nm
Clamping screws, bottom triple clamp SX/SMR/SXS	M8	10 Nm
Clamping screws, top triple clamp MXC/EXC	M8	20 Nm
Clamping screws, bottom triple clamp MXC/EXC	M8	15 Nm
Clamping screws, fork stubs	M8	15 Nm
Collar nut, rear wheel spindle	M20x1,5	80 Nm
Hexagon nut, swing arm bolt	M14x1,5/M16x1,5	100 Nm
Hexagon collar screw, handlebar clamp	M8	Loctite 243 + 20 Nm
Allan head screw, handlebar support	M10	Loctite 243 + 40 Nm
Shock absorber, top/bottom	M12	80 Nm
Sprocket nuts	M8	Loctite 243 + 35 Nm
Ball joint for push rod	M6	Loctite 243 + 10 Nm
Engine mounting bolt	M10	60 Nm
Engine brace	M8	33 Nm
Screw adjusting ring spring preload shock abs	M6	8Nm
Spoke nipple	M4,5 / M5	4-6 Nm
Hexagon screw for steering head	M20x1,5	10 Nm
AH screw for subframe	M8	Loctite 243 + 35 Nm
Rim lock	M8	10 Nm
Hexagon collar nut for seat mounting	M12x1	20 Nm
Other screws on chassis	M6	10 Nm
	M8	25 Nm
	M10	45 Nm
Other collar nuts on chassis	M6	15 Nm
	M8	30 Nm
	M10	50 Nm

PERIODIC MAINTENANCE SCHEDULE

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PERIODIC MAINTENANCE SCHEDULE		KTM rider		KTM dealer			
 <div>11.99 400/520 SX RACING 400/520 EXC RACING</div>		before each start	after washing	1st service, after 3 hours or 20 l fuel consumption	after 15 hours or 100 l fuel consumption	after 30 hours or 200 l fuel consumption	at least once a year
IF THE MOTORCYCLE IS USED PRIMARILY FOR OFF-ROAD RIDING OR COMPETITIVE RACING, THE 15 HOUR SERVICE NEEDS TO BE CARRIED OUT AFTER EACH RACE							
Check engine oil level		●					
Change engine oil				●	●		●
Clean short and long oil screen and magnet of the drain plug whenever you exchange the engine oil				●	●		
Change short and long oil filter unit				●	●		●
Check oil line for leakage and proper installation				●	●		
Check valve clearance and adjust if necessary				●	●		
Change spark plug						●	
Drain and clean carburetor float bowl			●			●	●
Adjust idling							●
Check breather hoses of engine case, gas tank and carburetor for correct position without buckles				●	●		
Clean air filter and air filter box			●		●		●
Check sprockets, chain guides and chain for wear		●		●	●		
Clean and lube chain		●	●		●		
Check chain tension		●		●	●		
Check cooling liquid level		●		●	●		
Check quality of antifreeze							●
Check cooling system for leaks		●		●	●		
Check exhaust system for leakage							●
Change exhaust muffler packing						●	
Clean spark arrestor (EXC USA)						●	●
Check exhaust brackets					●		●
Check brake fluid level front and rear		●		●	●		
Change brake fluid							●
Check brake pad thickness		●			●		
Check brake discs for wear and damage					●		
Check condition and correct installation of brake hoses		●		●	●		
Check free play and easy operation of hand brake lever and foot brake lever		●		●	●		
Check oil level of the master cylinder of the hydraulic clutch					●		
Change the oil of the hydraulic clutch							●
Check adjustment and function of telescopic fork		●			●		
Check telescopic fork for leaks					●		
Loosen breather bolts at fork legs (overpressure)			●		●		
Change fork oil							●
Perform a full maintenance job for the telescopic fork							●
Clean dust bellows on telescopic fork			●		●		●
Check steering head bearing clearance and adjust if necessary				●	●		
Clean and grease steering head bearings and its seals							●
Check adjustment and function of shock absorber		●			●		
Perform a full maintenance job for the shock absorber							●
Servicing swing arm pivots							●
Check tightness of spokes and rim joint		●		●	●		
Check wheel bearings for clearance		●			●		
Check tire condition and air pressure		●			●		●
Check cables for damage and easy working		●			●		●
Lube and adjust cables			●	●	●		●
Check the electrical system		●		●	●		
Check adjustment of headlight					●		
Spray emergency OFF switch, short circuit button and light switch with contact spray			●		●		
Check all bolts, nuts and hose clamps for proper tightness		●		●	●		
Grease or lube all pivot points and sliding components			●	●	●		

**SUPPLEMENTARY MAINTENANCE INSTRUCTIONS FOR THE 400/520 RACING
ENGINE MODEL 2000
(ADDITIONAL ORDER FOR KTM WORKSHOP)**

Hours	400 SX	400 MXC/EXC	520 SX	520 MXC/EXC
15	Small Maintenance Kit	–	Small Maintenance Kit	–
30	Small Maintenance Kit	Small Maintenance Kit	Small Maintenance Kit	Small Maintenance Kit
45	Large Maintenance Kit	–	Large Maintenance Kit	–
60	Small Maintenance Kit	Large Maintenance Kit	Small Maintenance Kit	Large Maintenance Kit
75	Small Maintenance Kit	–	Small Maintenance Kit	–
90	Large Maintenance Kit	Small Maintenance Kit	Large Maintenance Kit	Small Maintenance Kit
105	Small Maintenance Kit	–	Small Maintenance Kit	–
120	Small Maintenance Kit	Large Maintenance Kit	Small Maintenance Kit	Large Maintenance Kit

Spare Part Numbers of the Maintenance Kits - Model 2000

Maintenance Kit Small 400/520: 590.12.099.044

Maintenance Kit Large 400: 595.12.099.144

Maintenance Kit Large 520: 590.12.099.144

Please observe KTM TECHNICAL INFORMATION No: 0003/30/02-E !!!



PERIODIC MAINTENANCE SCHEDULE 2001

400/520 SX/MXC/EXC RACING

A washed motorcycle can be checked more quickly which saves money!		1st service after 3 hours or 20 l fuel	after/every 15 hours or 100 l fuel
ENGINE	Change engine oil, short and long oil filters	●	●
	Clean oil screen and drain plug magnet	●	●
	Check oil lines for damage or bends	●	●
	Replace spark plug (after 30 hours)		
	Check and adjust valve clearance	●	●
	Check engine mounting bolts for tightness	●	●
CARBURETOR	Check carburetor connection boot for cracks and leaks		●
	Check idle speed setting	●	●
	Check vent hoses for damage or bends	●	●
ADD-ON PARTS	Check cooling system for leaks, check quantity of antifreeze	●	●
	Check exhaust system for leaks and fitment		●
	Check cables for damage, smooth operation and bends adjust and lubricate	●	●
	Check fluid level of the clutch master cylinder	●	●
	Clean air filter and filter box		●
	Check electric wires for damage and bends		●
	Check headlamp setting		●
	Check function of electric systems (low/high beams, brake light, indicator indicator lamps, speedometer illumination, horn, emergency OFF switch or button	●	●
BRAKES	Check brake fluid level, lining thickness, brake discs	●	●
	Check brake lines for damage and leaks	●	●
	Check smooth operation and adjust free travel of handbrake/foot brake lever	●	●
	Check tightness of brake system bolts	●	●
CHASSIS	Check shock absorber and fork for leaks and function	●	●
	Clean fork dust bellows		●
	Bleed fork legs		●
	Check swing arm bearings		●
	Check/adjust steering head bearings	●	●
	Check tightness of chassis bolts (triple clamps, fork leg axle passage)	●	●
WHEELS	Check spoke tension and rim joint		●
	Check tires and air pressure	●	●
	Check chain, rear sprockets and chain guides for wear, fit and tension	●	●
	Lubricate chain	●	●
	Check clearance of wheel bearings	●	●

IMPORTANT RECOMMENDED MAINTENANCE WORK THAT CAN BE CARRIED OUT BY SPECIAL REQUEST

	at least once a year
Complete maintenance of fork	●
Complete maintenance of shock absorber	●
Clean and grease steering head bearings and gasket elements	●
Clean and adjust carburetor	●
Replace glass fibre yarn filling of the exhaust main silencer	●
Treat electric contacts and switches with contact spray	●
Treat battery connections with contact grease	●
Change hydraulic clutch fluid	●
Change brake fluid	●

IF MOTORCYCLE IS USED FOR COMPETITION A 15 HOUR SERVICE SHOULD BE CARRIED OUT AFTER EVERY RACE!
 SERVICE INTERVALS SHOULD NEVER BE EXCEEDED BY MORE THAN 2 HOURS OR 15 LITERS OF FUEL.
 MAINTENANCE WORK DONE BY KTM AUTHORISED WORKSHOPS IS NOT A SUBSTITUTE FOR THE CARE AND CHECKS BY THE RIDER!

IMPORTANT CHECKS AND MAINTENANCE TO BE CARRIED OUT BY THE RIDER

	Before each start	After every cleaning	For cross-country use
Check oil level	●		
Check brake fluid level	●		
Check brake pads for wear	●		
Check lights for function	●		
Check horn for function	●		
Lubricate and adjust cables and nipples		●	
Bleed fork legs regularly			●
Remove and clean fork dust bellows regularly			●
Clean and lubricate chain, check tension and adjust if necessary		●	●
Clean air filter and filter box			●
Check tires for pressure and wear	●		
Check cooling fluid level	●		
Check fuel lines for leaks	●		
Drain and clean float chamber		●	
Check all control elements for smooth operation	●		
Check brake performance	●	●	
Treat blank metal parts (with the exception of brake and exhaust system) with wax-based anticorrosion agent		●	
Treat ignition and steering locks and light switches with contact spray		●	
Check tightness of bolts, nuts and hose clamps regularly			●

**SUPPLEMENTARY MAINTENANCE INSTRUCTIONS FOR THE 400/520 RACING
ENGINE MODEL 2001
(ADDITIONAL ORDER FOR KTM WORKSHOP)**

Hours	400 SX	400 MXC/EXC	520 SX	520 MXC/EXC
15	Small Maintenance Kit	–	Small Maintenance Kit	–
30	Small Maintenance Kit	Small Maintenance Kit	Small Maintenance Kit	Small Maintenance Kit
45	Small Maintenance Kit	–	Small Maintenance Kit	–
60	Large Maintenance Kit	Small Maintenance Kit	Large Maintenance Kit	Small Maintenance Kit
75	Small Maintenance Kit	–	Small Maintenance Kit	–
90	Small Maintenance Kit	Large Maintenance Kit	Small Maintenance Kit	Large Maintenance Kit
105	Small Maintenance Kit	–	Small Maintenance Kit	–
120	Large Maintenance Kit	Small Maintenance Kit	Large Maintenance Kit	Small Maintenance Kit

Spare Part Numbers of the Maintenance Kits - Model 2001

Maintenance Kit Small 400/520: 590.12.199.044

Maintenance Kit Large 400/520: 590.12.199.144

Please observe KTM TECHNICAL INFORMATION No: 0011/30/05-E !!!



PERIODIC MAINTENANCE SCHEDULE 2002

250/400/520 SX/MXC/EXC RACING

A washed motorcycle can be checked more quickly which saves money!		1st service after 3 hours or 20 l fuel	after/every 15 hours or 100 l fuel
ENGINE	Change engine oil, short and long oil filters	●	●
	Clean oil screen and drain plug magnet	●	●
	Check oil lines for damage or bends	●	●
	Replace spark plug (after 30 hours)		
	Check and adjust valve clearance	●	●
	Check engine mounting bolts for tightness	●	●
CARBURETOR	Check carburetor connection boot for cracks and leaks		●
	Check idle speed setting	●	●
	Check vent hoses for damage or bends	●	●
ADD-ON PARTS	Check cooling system for leaks, check quantity of antifreeze	●	●
	Check exhaust system for leaks and fitment		●
	Check cables for damage, smooth operation and bends adjust and lubricate	●	●
	Check fluid level of the clutch master cylinder	●	●
	Clean air filter and filter box		●
	Check electric wires for damage and bends		●
	Check headlamp setting		●
	Check function of electric systems (low/ high beams, brake light, indicator indicator lamps, speedometer illumination, horn, emergency OFF switch or button	●	●
BRAKES	Check brake fluid level, lining thickness, brake discs	●	●
	Check brake lines for damage and leaks	●	●
	Check smooth operation and adjust free travel of handbrake/foot brake lever	●	●
	Check tightness of brake system screws	●	●
CHASSIS	Check shock absorber and fork for leaks and function	●	●
	Clean fork dust bellows		●
	Bleed fork legs		●
	Check swing arm bearings		●
	Check/adjust steering head bearings	●	●
	Check tightness of chassis screws (triple clamps, fork leg axle passage)	●	●
WHEELS	Check spoke tension and rim joint		●
	Check tires and air pressure	●	●
	Check chain, rear sprockets and chain guides for wear, fit and tension	●	●
	Lubricate chain	●	●
	Check clearance of wheel bearings	●	●

IMPORTANT RECOMMENDED MAINTENANCE WORK THAT CAN BE CARRIED OUT BY SPECIAL REQUEST

	at least once a year
Complete maintenance of fork	●
Complete maintenance of shock absorber	●
Clean and grease steering head bearings and gasket elements	●
Clean and adjust carburetor	●
Replace glass fibre yarn filling of the exhaust main silencer	●
Treat electric contacts and switches with contact spray	●
Treat battery connections with contact grease	●
Change hydraulic clutch fluid	●
Change brake fluid	●

IF MOTORCYCLE IS USED FOR COMPETITION, A 15-HOURS SERVICE SHOULD BE CARRIED OUT AFTER EVERY RACE!
 SERVICE INTERVALS SHOULD NEVER BE EXCEEDED BY MORE THAN 2 HOURS OR 15 LITERS OF FUEL.
 MAINTENANCE WORK DONE BY KTM AUTHORISED WORKSHOPS IS NOT A SUBSTITUTE FOR THE CARE AND CHECKS BY THE RIDER!

IMPORTANT CHECKS AND MAINTENANCE TO BE CARRIED OUT BY THE RIDER

	Before each start	After every cleaning	For cross-country use
Check oil level	●		
Check brake fluid level	●		
Check brake pads for wear	●		
Check lights for function	●		
Check horn for function	●		
Lubricate and adjust cables and nipples		●	
Bleed fork legs regularly			●
Remove and clean fork dust bellows regularly			●
Clean and lubricate chain, check tension and adjust if necessary		●	●
Clean air filter and filter box			●
Check tires for pressure and wear	●		
Check cooling fluid level	●		
Check fuel lines for leaks	●		
Drain and clean float chamber		●	
Check all control elements for smooth operation	●		
Check brake performance	●	●	
Treat blank metal parts (with the exception of brake and exhaust system) with wax-based anti corrosion agent		●	
Treat ignition and steering locks and light switches with contact spray		●	
Check tightness of screws, nuts and hose clamps regularly			●

**CONTINUED TESTS OF THE 250/400/520 RACING MOTOR FOR KTM'S SPECIALIZED WORKSHOP
(ADDITIONAL ORDER FOR KTM'S SPECIALIZED WORKSHOP)**

a 100 l fuel consumption is equivalent to approx. 15 operating hours	30 hours 200 l	45 hours 300 l	60 hours 400 l	90 hours 600 l	120 hours 800 l	135 hours 900 l
Force fit of clutch drive shaft		●		●		●
Clutch disk wear	●	●	●	●	●	●
Cylinder and piston wear		●		●		●
Groove piston-pin retainer wear		●		●		●
Camshaft wear		●		●		●
Radial clearance of camshaft bearing		●		●		●
Valve spring length		●		●		●
Spring washer wear		●		●		●
Valve disk slack		●		●		●
Valve guide wear		●		●		●
Radial clearance of rocker-arm roller		●		●		●
Elongation of timing chain		●		●		●
Wear of toothing on chain tensioner	●	●	●	●	●	●
Crankshaft journal/crankshaft wear		●		●		●
Radial clearance of conrod bearing		●		●		●
Radial clearance of piston pin bearing		●		●		●
Wear of balancing shaft bearing		●		●		●
Wear of crankshaft bearing		●		●		●
Transmission wear		●		●		●
Flection of transmission shafts		●		●		●
Length of bypass valve spring		●		●		●



PERIODIC MAINTENANCE SCHEDULE 2003

250/450/525 SX/MXC/EXC RACING

A clean motorcycle can be checked more quickly which saves money!		1. service after 3 hours or 20 l fuel	after/every 15 hours or 100 l fuel
ENGINE	Change engine oil, short and long oil filters	●	●
	Clean oil screen and drain plug magnet	●	●
	Check oil lines for damage or bends	●	●
	Replace spark plug (after 30 hours)		
	Check and adjust valve clearance	●	●
	Check engine mounting bolts for tightness	●	●
CARBURETOR	Check carburetor connection boot for cracks and leaks		●
	Check idle speed setting	●	●
	Check vent hoses for damage or bends	●	●
ADD-ON PARTS	Check cooling system for leaks, check quantity of antifreeze	●	●
	Check exhaust system for leaks and fitment		●
	Check cables for damage, smooth operation and bends adjust and lubricate	●	●
	Check fluid level of the clutch master cylinder	●	●
	Clean air filter and filter box		●
	Check electric wires for damage and bends		●
	Check headlamp setting		●
	Check function of electric systems (low high beam, brake light, indicator lamps, speedometer illumination, horn, emergency OFF switch or button)	●	●
BRAKES	Check brake fluid level, lining thickness, brake discs	●	●
	Check brake lines for damage and leaks	●	●
	Check/function smooth operation and adjust free travel of handbrake/foot brake lever	●	●
	Check tightness of brake system screws	●	●
CHASSIS	Check shock absorber and fork for leaks and function	●	●
	Clean fork dust bellows		●
	Bleed fork legs		●
	Check swing arm bearings		●
	Check/adjust steering head bearings	●	●
	Check tightness of chassis screws (triple clamps, fork leg axle passage)	●	●
WHEELS	Check spoke tension and rim joint		●
	Check tires and air pressure	●	●
	Check chain, chain joint, rear sprockets and chain guides for wear, fit and tension	●	●
	Lubricate chain	●	●
	Check clearance of wheel bearings	●	●

IMPORTANT RECOMMENDED MAINTENANCE WORK THAT CAN BE CARRIED OUT BY EXTRA ORDER

	at least once a year
Complete maintenance of fork	●
Complete maintenance of shock absorber	●
Clean and grease steering head bearings and gasket elements	●
Clean and adjust carburetor	●
Replace glass fibre yarn filling of the exhaust main silencer	●
Treat electric contacts and switches with contact spray	●
Treat battery connections with contact grease	●
Change hydraulic clutch fluid	●
Change brake fluid	●

IF MOTORCYCLE IS USED FOR COMPETITION 15 HOURS SERVICE SHOULD BE CARRIED OUT AFTER EVERY RACE.
 SERVICE INTERVALLS SHOULD NEVER BE EXCEEDED BY MORE THAN 2 HOURS OR 15 LITERS OF FUEL.
 MAINTENANCE WORK DONE BY KTM AUTHORISED WORKSHOPS IS NOT A SUBSTITUTE FOR CARE AND CHECKS DONE BY THE RIDER.

IMPORTANT CHECKS AND MAINTENANCE TO BE CARRIED OUT BY THE RIDER

	Before each start	After every cleaning	For cross-country use
Check oil level	●		
Check brake fluid level	●		
Check brake pads for wear	●		
Check lights for function	●		
Check horn for function	●		
Lubricate and adjust cables and nipples		●	
Bleed fork legs regularly			●
Remove and clean fork dust bellows regularly			●
Clean and lubricate chain, check tension and adjust if necessary		●	●
Clean air filter and filter box			●
Check tires for pressure and wear	●		
Check cooling fluid level	●		
Check fuel lines for leaks	●		
Drain and clean float chamber		●	
Check all control elements for smooth operation	●		
Check brake performance	●	●	
Treat blank metal parts (with the exception of brake and exhaust system) with wax-based anti corrosion agent		●	
Treat ignition and steering locks and light switches with contact spray		●	
Check tightness of screws, nuts and hose clamps regularly			●

RECOMMENDED INSPECTION OF THE 250/450/525 SX AND EXC ENGINE USED FOR ENDURO COMPETITIONS BY YOUR KTM WORKSHOP (ADDITIONAL ORDER FOR THE KTM WORKSHOP)						
a 100 liter fuel consumption is equivalent to approx. 15 operating hours	30 hours 200 liter	45 hours 300 liter	60 hours 400 liter	90 hours 600 liter	120 hours 800 liter	135 hours 900 liter
Check the clutch disks for wear	●	●	●	●	●	●
Check the length of the clutch springs	●	●	●	●	●	●
Check the cylinder and piston for wear		●		●		●
Check the groove on the piston pin retainer for wear (visual check)		●		●		●
Check the camshaft for wear (visual check)		●		●		●
Replace the camshaft bearings		●		●		●
Check the length of the valve springs		●		●		●
Check the spring cap for wear		●		●		●
Check the eccentricity of the valve disk		●		●		●
Check the valve guides for wear		●		●		●
Check the radial clearance of the rocker arm rollers		●		●		●
Check the elongation of the timing chain		●		●		●
Check the chain tensioner tooting for damage (visual check)	●	●	●	●	●	●
Check the eccentricity of the crankshaft journal		●		●		●
Replace the conrod bearings		●		●		●
Check piston pin bearing		●		●		●
Replace the balancer shaft bearings		●		●		●
Replace the crankshaft main bearings		●		●		●
Check the entire transmission including the roller and bearings for wear		●		●		●
Check the length of the bypass valve spring		●		●		●

NOTE: IF THE INSPECTION ESTABLISHES THAT PERMISSIBLE TOLERANCES ARE EXCEEDED, THE RESPECTIVE COMPONENTS MUST BE REPLACED.

**RECOMMENDED INSPECTION OF THE 250/450/525 EXC ENGINE
USED FOR HOBBY - ENDURO COMPETITIONS BY YOUR KTM WORKSHOP
(ADDITIONAL ORDER FOR THE KTM WORKSHOP)**

a 100 liter fuel consumption is equivalent to approx. 15 operating hours	60 hours 400 liter	90 hours 600 liter	120 hours 800 liter	180 hours 1200 liter	240 hours 1600 liter	270 hours 1800 liter
Check the clutch disks for wear	●	●	●	●	●	●
Check the length of the clutch springs	●	●	●	●	●	●
Check the cylinder and piston for wear		●		●		●
Check the groove on the piston pin retainer for wear (visual check)		●		●		●
Check the camshaft for wear (visual check)		●		●		●
Replace the camshaft bearings		●		●		●
Check the length of the valve springs		●		●		●
Check the spring cap for wear		●		●		●
Check the eccentricity of the valve disk		●		●		●
Check the valve guides for wear		●		●		●
Check the radial clearance of the rocker arm rollers		●		●		●
Check the elongation of the timing chain		●		●		●
Check the chain tensioner tooting for damage (visual check)	●	●	●	●	●	●
Check the eccentricity of the crankshaft journal		●		●		●
Replace the conrod bearings		●		●		●
Check piston pin bearing		●		●		●
Replace the balancer shaft bearings		●		●		●
Replace the crankshaft main bearings		●		●		●
Check the entire transmission including the roller and bearings for wear		●		●		●
Check the length of the bypass valve spring		●		●		●

NOTE: IF THE INSPECTION ESTABLISHES THAT PERMISSIBLE TOLERANCES ARE EXCEEDED, THE RESPECTIVE COMPONENTS MUST BE REPLACED.



PERIODIC MAINTENANCE SCHEDULE 2004

250/450/525 SX/MXC/EXC RACING

A clean motorcycle can be checked more quickly which saves money!		1. service after 3 hours or 20 l fuel	after/every 15 hours or 100 l fuel
ENGINE	Change engine oil, short and long oil filters	●	●
	Clean oil screen and drain plug magnet	●	●
	Check oil lines for damage or bends	●	●
	Replace spark plug (after 30 hours)		
	Check and adjust valve clearance	●	●
	Check engine mounting bolts for tightness	●	●
CARBURETOR	Check carburetor connection boot for cracks and leaks		●
	Check idle speed setting	●	●
	Check vent hoses for damage or bends	●	●
ADD-ON PARTS	Check cooling system for leaks, check quantity of antifreeze	●	●
	Check exhaust system for leaks and fitment		●
	Check cables for damage, smooth operation and bends adjust and lubricate	●	●
	Check fluid level of the clutch master cylinder	●	●
	Clean air filter and filter box		●
	Check electric wires for damage and bends		●
	Check headlamp setting		●
	Check function of electric systems (low high beam, brake light, indicator lamps, speedometer illumination, horn, emergency OFF switch or button	●	●
BRAKES	Check brake fluid level, lining thickness, brake discs	●	●
	Check brake lines for damage and leaks	●	●
	Check/function smooth operation and adjust free travel of handbrake/foot brake lever	●	●
	Check tightness of brake system screws	●	●
CHASSIS	Check shock absorber and fork for leaks and function	●	●
	Clean fork dust bellows		●
	Bleed fork legs		●
	Check swing arm bearings		●
	Check/adjust steering head bearings	●	●
	Check tightness of chassis screws (triple clamps, fork leg axle passage)	●	●
WHEELS	Check spoke tension and rim joint	●	●
	Check tires and air pressure	●	●
	Check chain, chain joint, rear sprockets and chain guides for wear, fit and tension	●	●
	Lubricate chain	●	●
	Check clearance of wheel bearings	●	●

IMPORTANT RECOMMENDED MAINTENANCE WORK THAT CAN BE CARRIED OUT BY EXTRA ORDER

	at least once a year
Complete maintenance of fork	●
Complete maintenance of shock absorber	●
Clean and grease steering head bearings and gasket elements	●
Clean and adjust carburetor	●
Replace glass fibre yarn filling of the exhaust main silencer	●
Treat electric contacts and switches with contact spray	●
Treat battery connections with contact grease	●
Change hydraulic clutch fluid	●
Change brake fluid	●

IF MOTORCYCLE IS USED FOR COMPETITION 15 HOURS SERVICE SHOULD BE CARRIED OUT AFTER EVERY RACE.
 SERVICE INTERVALLS SHOULD NEVER BE EXCEEDED BY MORE THAN 2 HOURS OR 15 LITERS OF FUEL.
 MAINTENANCE WORK DONE BY KTM AUTHORISED WORKSHOPS IS NOT A SUBSTITUTE FOR CARE AND CHECKS DONE BY THE RIDER.

IMPORTANT CHECKS AND MAINTENANCE TO BE CARRIED OUT BY THE RIDER

	Before each start	After every cleaning	For cross-country use
Check oil level	●		
Check brake fluid level	●		
Check brake pads for wear	●		
Check lights for function	●		
Check horn for function	●		
Lubricate and adjust cables and nipples		●	
Bleed fork legs regularly			●
Remove and clean fork dust bellows regularly			●
Clean and lubricate chain, check tension and adjust if necessary		●	●
Clean air filter and filter box			●
Check tires for pressure and wear	●		
Check cooling fluid level	●		
Check fuel lines for leaks	●		
Drain and clean float chamber		●	
Check all control elements for smooth operation	●		
Check brake performance	●	●	
Treat blank metal parts (with the exception of brake and exhaust system) with wax-based anti corrosion agent		●	
Treat ignition and steering locks and light switches with contact spray		●	
Check tightness of screws, nuts and hose clamps regularly			●

**RECOMMENDED INSPECTION OF THE 250/450/525 SX AND EXC ENGINE
USED FOR ENDURO COMPETITIONS BY YOUR KTM WORKSHOP
(ADDITIONAL ORDER FOR THE KTM WORKSHOP)**

a 100 liter fuel consumption is equivalent to approx. 15 operating hours	15 hours 100 liter	30 hours 200 liter	45 hours 300 liter	60 hours 400 liter	90 hours 600 liter	120 hours 800 liter	135 hours 900 liter
Check the clutch disks for wear	●	●	●	●	●	●	●
Check the length of the clutch springs		●	●	●	●	●	●
Check the cylinder and piston for wear			●		●		●
Check the groove on the piston pin retainer for wear (visual check)			●		●		●
Check the camshaft for wear (visual check)			●		●		●
Replace the camshaft bearings			●		●		●
Check the length of the valve springs			●		●		●
Check the spring cap for wear			●		●		●
Check the eccentricity of the valve disk			●		●		●
Check the valve guides for wear			●		●		●
Check the radial clearance of the rocker arm rollers			●		●		●
Check the elongation of the timing chain			●		●		●
Check the chain tensioner tooting for damage (visual check)		●	●	●	●	●	●
Check the eccentricity of the crankshaft journal			●		●		●
Replace the conrod bearings			●		●		●
Check piston pin bearing			●		●		●
Replace the balancer shaft bearings			●		●		●
Replace the crankshaft main bearings			●		●		●
Check the entire transmission including the roller and bearings for wear			●		●		●
Check the length of the bypass valve spring			●		●		●

NOTE: IF THE INSPECTION ESTABLISHES THAT PERMISSIBLE TOLERANCES ARE EXCEEDED, THE RESPECTIVE COMPONENTS MUST BE REPLACED.

**RECOMMENDED INSPECTION OF THE 250/450/525 EXC ENGINE
USED FOR HOBBY - ENDURO COMPETITIONS BY YOUR KTM WORKSHOP
(ADDITIONAL ORDER FOR THE KTM WORKSHOP)**

a 100 liter fuel consumption is equivalent to approx. 15 operating hours	30 hours 200 liter	60 hours 400 liter	90 hours 600 liter	120 hours 800 liter	180 hours 1200 liter	240 hours 1600 liter	270 hours 1800 liter
Check the clutch disks for wear	●	●	●	●	●	●	●
Check the length of the clutch springs		●	●	●	●	●	●
Check the cylinder and piston for wear			●		●		●
Check the groove on the piston pin retainer for wear (visual check)			●		●		●
Check the camshaft for wear (visual check)			●		●		●
Replace the camshaft bearings			●		●		●
Check the length of the valve springs			●		●		●
Check the spring cap for wear			●		●		●
Check the eccentricity of the valve disk			●		●		●
Check the valve guides for wear			●		●		●
Check the radial clearance of the rocker arm rollers			●		●		●
Check the elongation of the timing chain			●		●		●
Check the chain tensioner toothing for damage (visual check)		●	●	●	●	●	●
Check the eccentricity of the crankshaft journal			●		●		●
Replace the conrod bearings			●		●		●
Check piston pin bearing			●		●		●
Replace the balancer shaft bearings			●		●		●
Replace the crankshaft main bearings			●		●		●
Check the entire transmission including the roller and bearings for wear			●		●		●
Check the length of the bypass valve spring			●		●		●

NOTE: IF THE INSPECTION ESTABLISHES THAT PERMISSIBLE TOLERANCES ARE EXCEEDED, THE RESPECTIVE COMPONENTS MUST BE REPLACED.



A CLEAN MOTORCYCLE CAN BE CHECKED MORE QUICKLY WHICH SAVES MONEY!		1. service after 3 hours or 20 l fuel	after/every 15 hours or 100 l fuel
ENGINE	Change engine oil, short and long oil filters	●	●
	Clean oil screen and drain plug magnet	●	●
	Check oil lines for damage or bends	●	●
	Replace spark plug (after 30 hours)		
	Check and adjust valve clearance	●	●
	Check engine mounting bolts for tightness	●	●
CARBURETOR	Check carburetor connection boot for cracks and leaks		●
	Check idle speed setting	●	●
	Check vent hoses for damage or bends	●	●
ADD- ON PARTS	Check cooling system for leaks, check quantity of antifreeze	●	●
	Check exhaust system for leaks and fitment		●
	Check cables for damage, smooth operation and bends adjust and lubricate	●	●
	Check fluid level of the clutch master cylinder	●	●
	Clean air filter and filter box		●
	Check electric wires for damage and bends		●
	Check headlamp setting		●
	Check function of electric systems (low high beam, brake light, indicator lamps, speedometer illumination, horn, emergency OFF switch or button)	●	●
BRAKES	Check brake fluid level, lining thickness, brake discs	●	●
	Check brake lines for damage and leaks	●	●
	Check/function smooth operation and adjust free travel of handbrake/foot brake lever	●	●
	Check tightness of brake system screws	●	●
CHASSIS	Check shock absorber and fork for leaks and function	●	●
	Clean fork dust bellows		●
	Bleed fork legs		●
	Check swing arm bearings		●
	Check/adjust steering head bearings	●	●
	Check tightness of chassis screws (triple clamps, fork leg axle passage)	●	●
WHEELS	Check spoke tension and rim joint	●	●
	Check tires and air pressure	●	●
	Check chain, chain joint, rear sprockets and chain guides for wear, fit and tension	●	●
	Lubricate chain	●	●
	Check clearance of wheel bearings	●	●

IMPORTANT RECOMMENDED MAINTENANCE WORK THAT CAN BE CARRIED OUT BY EXTRA ORDER

	at least once a year
Complete maintenance of fork	●
Complete maintenance of shock absorber	●
Clean and grease steering head bearings and gasket elements	●
Clean and adjust carburetor	●
Replace glass fibre yarn filling of the exhaust main silencer	●
Treat electric contacts and switches with contact spray	●
Treat battery connections with contact grease	●
Change hydraulic clutch fluid	●
Change brake fluid	●

IF MOTORCYCLE IS USED FOR COMPETITION 15 HOURS SERVICE SHOULD BE CARRIED OUT AFTER EVERY RACE.

Service intervals should never be exceeded by more than 2 hours or 15 liters of fuel.

Maintenance work done by KTM authorised workshops is not a substitute for care and checks done by the rider.

IMPORTANT CHECKS AND MAINTENANCE TO BE CARRIED OUT BY THE RIDER			
	Before each start	After every cleaning	For cross-country use
Check oil level	●		
Check brake fluid level	●		
Check brake pads for wear	●		
Check lights for function	●		
Check horn for function	●		
Lubricate and adjust cables and nipples		●	
Bleed fork legs regularly			●
Remove and clean fork dust bellows regularly			●
Clean and lubricate chain, check tension and adjust if necessary		●	●
Clean air filter and filter box			●
Check tires for pressure and wear	●		
Check cooling fluid level	●		
Check fuel lines for leaks	●		
Drain and clean float chamber		●	
Check all control elements for smooth operation	●		
Check brake performance	●	●	
Treat blank metal parts (with the exception of brake and exhaust system) with wax-based anti corrosion agent		●	
Treat ignition and steering locks and light switches with contact spray		●	
Check tightness of screws, nuts and hose clamps regularly			●

**RECOMMENDED INSPECTION OF THE 250-610 RACING ENGINE USED FOR ENDURO COMPETITIONS BY THE KTM WORKSHOP
(ADDITIONAL ORDER FOR THE KTM WORKSHOP)**

a 100 liter fuel consumption is equivalent to approx. 15 operating hours	15 hours 100 liter	30 hours 200 liter	45 hours 300 liter	60 hours 400 liter	90 hours 600 liter	120 hours 800 liter	35 hours 900 liter
Check the clutch disks for wear	●	●	●	●	●	●	●
Check the length of the clutch springs		●	●	●	●	●	●
Check the cylinder and piston for wear			●		●		●
Check the groove on the piston pin retainer for wear (visual check)			●		●		●
Check the camshaft for wear (visual check)			●		●		●
Replace the camshaft bearings			●		●		●
Check the length of the valve springs			●		●		●
Check the spring cap for wear			●		●		●
Check the eccentricity of the valve disk			●		●		●
Check the valve guides for wear			●		●		●
Check the radial clearance of the rocker arm rollers			●		●		●
Check the elongation of the timing chain			●		●		●
Check the chain tensioner tooting for damage (visual check)		●	●	●	●	●	●
Check the eccentricity of the crankshaft journal			●		●		●
Replace the conrod bearings			●		●		●
Check piston pin bearing			●		●		●
Replace the balancer shaft bearings			●		●		●
Replace the crankshaft main bearings			●		●		●
Check the entire transmission including the roller and bearings for wear			●		●		●
Check the length of the bypass valve spring			●		●		●

**RECOMMENDED INSPECTION OF THE 250-610 RACING ENGINE USED FOR HOBBY - ENDURO COMPETITIONS BY THE KTM WORKSHOP
(ADDITIONAL ORDER FOR THE KTM WORKSHOP)**

a 100 liter fuel consumption is equivalent to approx. 15 operating hours	30 hours 200 liter	60 hours 400 liter	90 hours 600 liter	120 hours 800 liter	180 hours 1200 liter	240 hours 1600 liter	270 hours 1800 liter
Check the clutch disks for wear	●	●	●	●	●	●	●
Check the length of the clutch springs		●	●	●	●	●	●
Check the cylinder and piston for wear			●		●		●
Check the groove on the piston pin retainer for wear (visual check)			●		●		●
Check the camshaft for wear (visual check)			●		●		●
Replace the camshaft bearings			●		●		●
Check the length of the valve springs			●		●		●
Check the spring cap for wear			●		●		●
Check the eccentricity of the valve disk			●		●		●
Check the valve guides for wear			●		●		●
Check the radial clearance of the rocker arm rollers			●		●		●
Check the elongation of the timing chain			●		●		●
Check the chain tensioner tooting for damage (visual check)		●	●	●	●	●	●
Check the eccentricity of the crankshaft journal			●		●		●
Replace the conrod bearings			●		●		●
Check piston pin bearing			●		●		●
Replace the balancer shaft bearings			●		●		●
Replace the crankshaft main bearings			●		●		●
Check the entire transmission including the roller and bearings for wear			●		●		●
Check the length of the bypass valve spring			●		●		●

NOTE: IF THE INSPECTION ESTABLISHES THAT PERMISSIBLE TOLERANCES ARE EXCEEDED, THE RESPECTIVE COMPONENTS MUST BE REPLACED.

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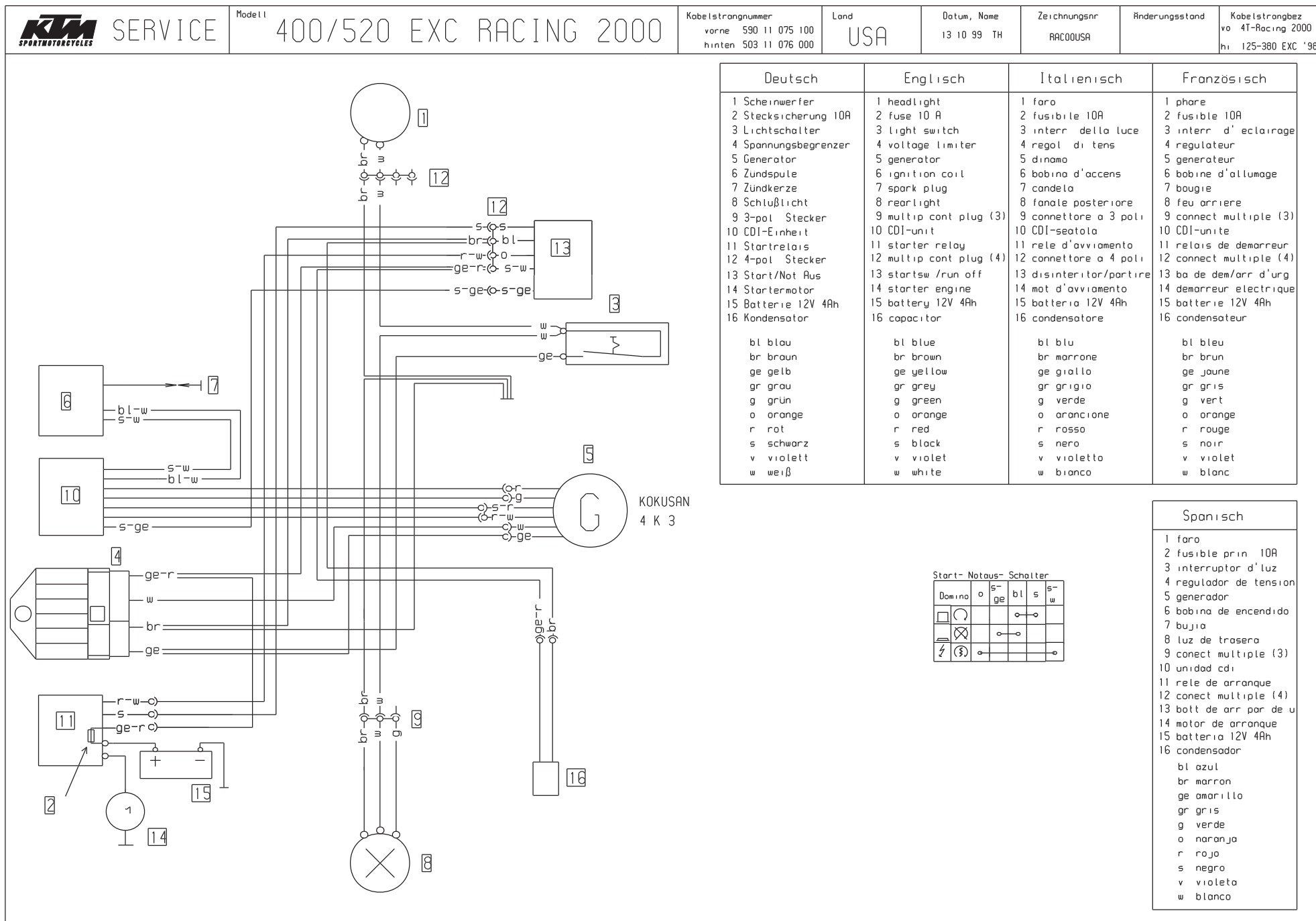
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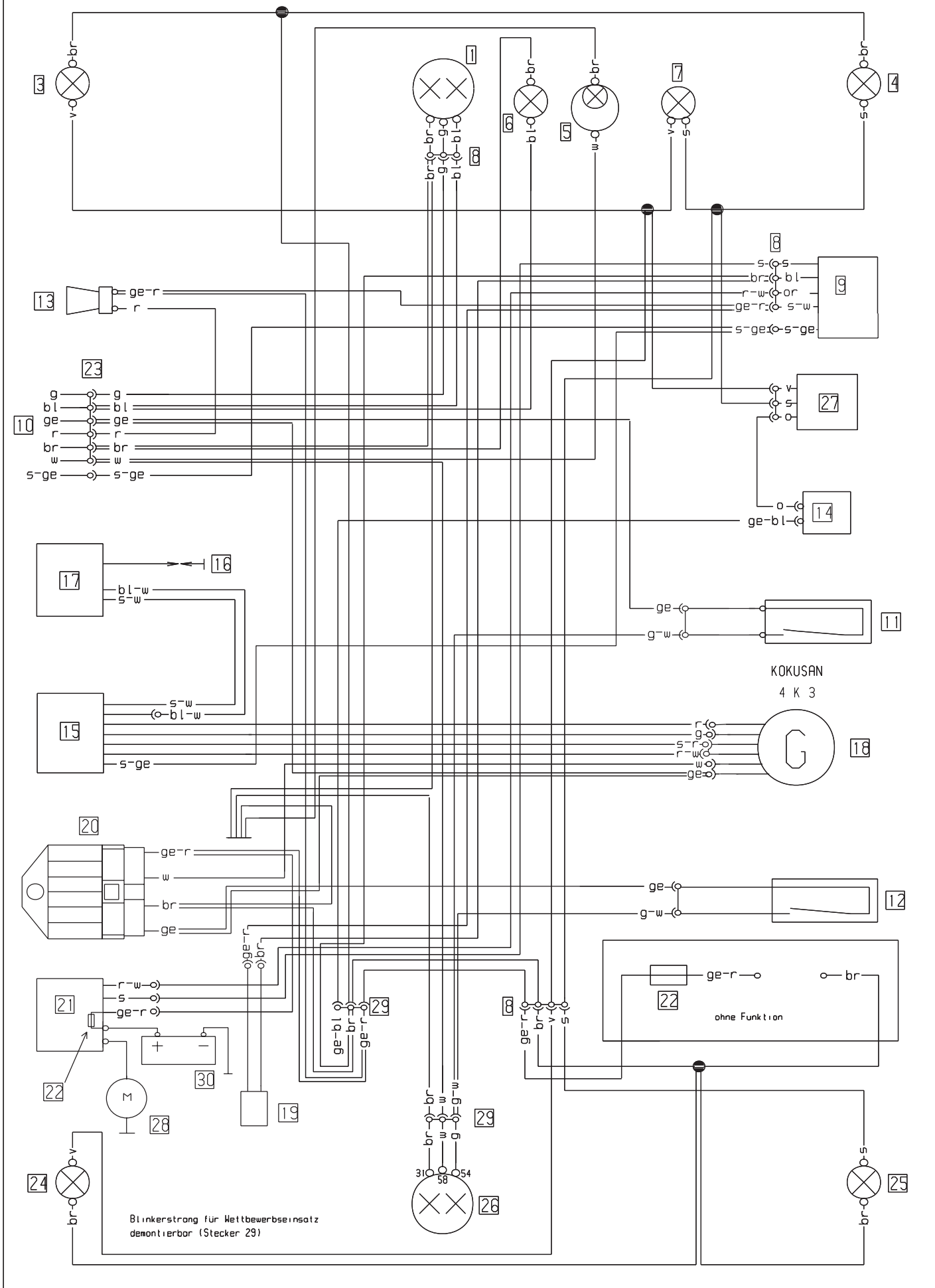
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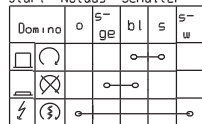
400/520 EXC RACING 2000

Deutsch	Englisch	Italienisch	Französisch
1 Scheinwerfer	1 headlight	1 faro	1 phare
3 Blinker li vo	3 turn indic left fr	3 lampegg ant sn	3 clignoteur av gauche
4 Blinker re vo	4 turn indic right fr	4 lampegg ant dx	4 clignoteur av droit
5 Tachobeleuchtung	5 speedometer light	5 luce di tachimetro	5 éclair comp vitesse
6 Fernlichtkontrolle	6 high beam indicator	6 spia abbagliante	6 témoin feu route
7 Blinkerkontrolle	7 turn indicator	7 spia lampeggiatori	7 témoin de clignoteur
8 4-pol Stecker	8 multip cont plug (4)	8 connettore a 4 poli	8 connect multiple (4)
9 Start / Not Aus	9 startsw /run-off	9 disinteritor/partire	9 ba de dem /arr d'urg
10 zum Kombischalter	10 to combinat switch	10 multicomando	10 commodo
11 Bremslichtsch vo	11 stoplight switch f	11 int luce arresto ant	11 contact de stop av
12 Bremslichtsch hi	12 stoplight switch r	12 int luce arresto post	12 contact Harr de stop
13 Horn	13 horn	13 clacson	13 klaxon
14 Blinkgeber	14 turn indicator	14 trasmett di lampeg	14 centrale clignot
15 CDI-Einheit	15 CDI-unit	15 CDI-seatola	15 boitier CDI
16 Zündkerze	16 spark plug	16 candela	16 bougie
17 Zündspule	17 ignition coil	17 bobina d'accens	17 bobine d'allumage
18 Generator	18 generator	18 dinamo	18 generateur
19 Kondensator	19 capacitor	19 condensatore	19 condensateur
20 Spannungsregler	20 voltage regulator	20 regol di tens	20 regulateur
21 Startrelais	21 starter relay	21 rele d'avviamento	21 relais de demarreur
22 Stecksicherung 10A	22 fuse 10A	22 fusibile 10A	22 fusible 10A
23 6-pol Stecker	23 multip cont plug (6)	23 connettore a 6 poli	23 connect multiple (6)
24 Blinker li hi	24 blinker left rear	24 lampegg post sn	24 clign arr gauche
25 Blinker re hi	25 blinker right rear	25 lampegg post dx	25 clign arr droite
26 Brems-Schlußlicht	26 rear-stoplight	26 fanal post di freno	26 feu arr et de stop
27 Blinkerschalter	27 blink switch	27 int lampeggiatori	27 contact d clignoteur
28 Startermotor	28 starter engine	28 mot d'avviamento	28 demrreur electrique
29 3-pol Stecker	29 multip cont plug (3)	29 connettore a 3 poli	29 connect multiple (3)
30 Batterie 12V 4Ah	30 battery 12V 4Ah	30 batteria 12V 4Ah	30 batterie 12V 4Ah

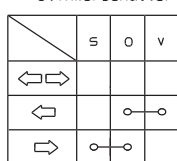
Deutsch	Englisch	Italienisch	Französisch	Spanisch
bl blau	bl blue	bl blu	bl bleu	bl azul
br braun	br brown	br marrone	br brun	br marron
ge gelb	ge yellow	ge giallo	ge jaune	ge amarillo
gr grau	gr grey	gr grigio	gr gris	gr gris
g grün	g green	g verde	g vert	g verde
o orange	o orange	o arancione	o orange	o naranja
r rot	r red	r rosso	r rouge	r rojo
s schwarz	s black	s nero	s noir	s negro
v violett	v violet	v violetto	v violet	v violeta
w weiß	w white	w bianco	w blanc	w blanco

Spanisch
1 faro
3 interm izquierdo delantero
4 intermitente derecho delantero
5 luz tacometro
6 lampara aviso luces largas
7 lampara aviso intermitentes
8 conector multiple (4)
9 boton de arr par de urg
10 interruptor combinado
11 interr luz de freno del
12 interr luz de fren tras
13 claxon
14 conjunto del intermintente
15 unidad cdi
16 bujia
17 bobina de encendido
18 generador
19 condensador
20 regulador de tension
21 rele de arranque
22 fusible principal 10A
23 conector multiple (6)
24 intermitente izquierdo trasero
25 intermitente derecho trasero
26 luz de freno trasero
27 interruptor clignoteur
28 motor de arranque
29 conector multiple (3)
30 batteria 12V 4Ah

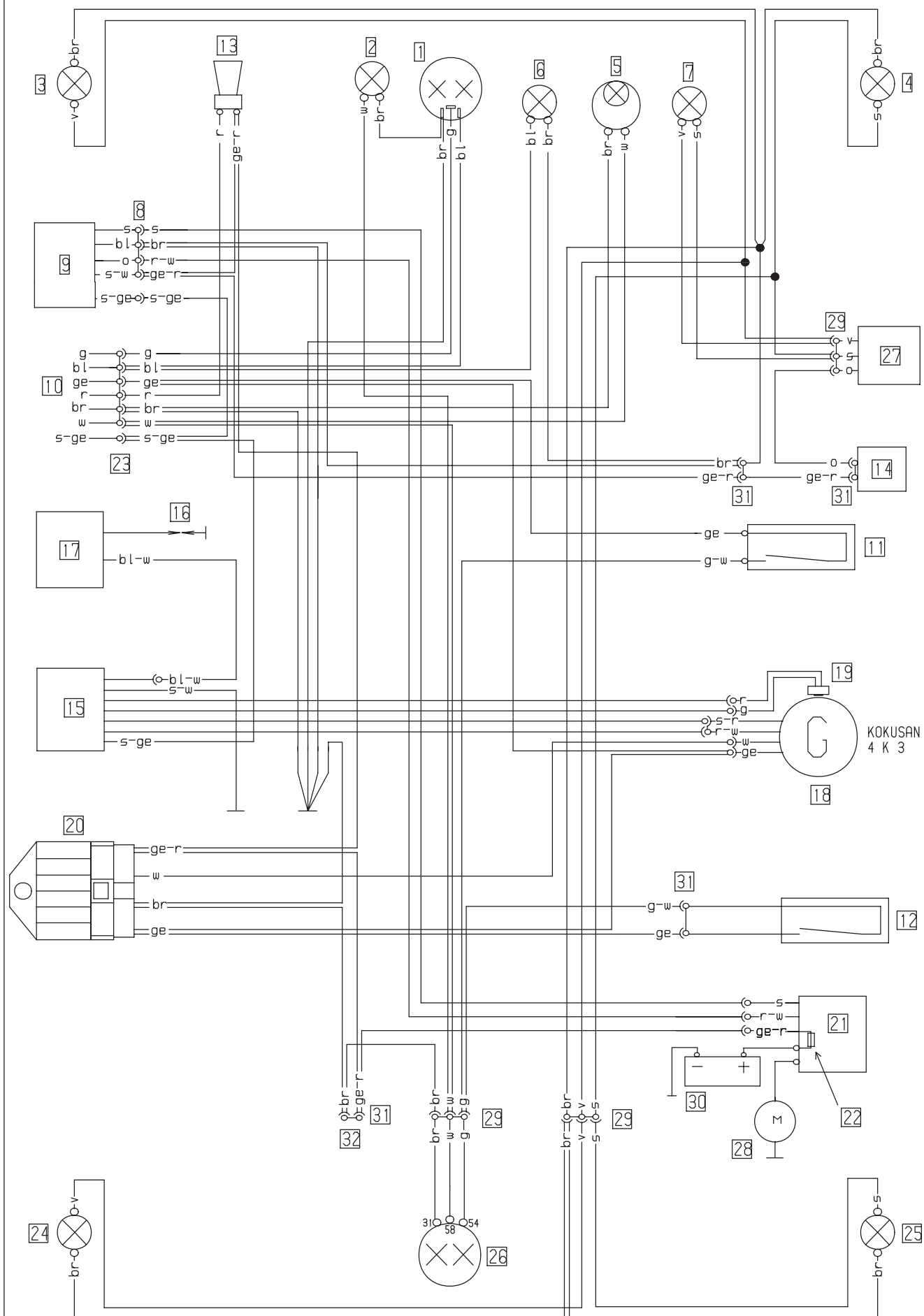
Start- Notaus- Schalter



Blinkerschalter

Kontaktbelegung -
Lichtschalter (Typ CEV 9610)

	g	bl	ge	w	s/ ge	r	br
LICHT =							
Abblendl	○	○	○	○			
Fernlicht		○	○	○			
HUPE						○	○
ZÜNDUNG AUS					○	○	
	5	2	1	3	6	4	



400/520 EXC RACING 2001 EU, AUS

Deutsch	Englisch	Italienisch	Französisch
1 Scheinwerfer	1 headlight	1 faro	1 phare
2 Standlicht	2 position light	2 luce di posizione	2 feu de position
3 Blinker li vo	3 turn indic left fr	3 lampegg ant sn	3 clignoteur av gauche
4 Blinker re vo	4 turn indic right fr	4 lampegg ant dx	4 clignoteur av droit
5 Tachobeleuchtung	5 speedometer light	5 luce di tachimetro	5 éclair comp vitesse
6 Fernlichtkontrolle	6 high beam indicator	6 spia abbagliante	6 témoin feu route
7 Blinkerkontrolle	7 turn indicator	7 spia lampeggiatori	7 témoin de clignoteur
8 4-pol Stecker	8 multip cont plug (4)	8 connettore a 4 poli	8 connect multiple (4)
9 Start / Not Aus	9 startsw /run-off	9 disinteritor/partire	9 ba de dem /arr d'urg
10 zum Kombischalter	10 to combinat switch	10 multicomando	10 commodo
11 Bremslichtsch vo	11 stoplight switch f	11 int luce arresto ant	11 contact de stop av
12 Bremslichtsch hi	12 stoplight switch r	12 int luce arresto post	12 contact Harr de stop
13 Horn	13 horn	13 clacson	13 klaxon
14 Blinkgeber	14 turn indicator	14 trasmett di lampeg	14 centrale clignot
15 CDI-Einheit	15 CDI-unit	15 CDI-seatola	15 boitier CDI
16 Zündkerze	16 spark plug	16 candela	16 bougie
17 Zündspule	17 ignition coil	17 bobina d'accens	17 bobine d'allumage
18 Generator	18 generator	18 dinamo	18 generateur
19 Impulsgeber	19 pulser coil	19 trasmett d'impuls	19 generateur d'impuls
20 Spannungsregler	20 voltage regulator	20 regol di tens	20 regulateur
21 Startrelais	21 starter relay	21 rele d'avviamento	21 relais de demarreur
22 Stecksicherung 10A	22 fuse 10A	22 fusibile 10A	22 fusible 10A
23 6-pol Stecker	23 multip cont plug (6)	23 connettore a 6 poli	23 connect multiple (6)
24 Blinker li hi	24 blinker left rear	24 lampegg post sn	24 clign arr gauche
25 Blinker re hi	25 blinker right rear	25 lampegg post dx	25 clign arr droite
26 Brems-Schlußlicht	26 rear-stoplight	26 fanal post di freno	26 feu arr et de stop
27 Blinkerschalter	27 blink switch	27 int lampeggiatori	27 contact d clignoteur
28 Startermotor	28 starter engine	28 mot d'avviamento	28 demrreur electrique
29 3-pol Stecker	29 multip cont plug (3)	29 connettore a 3 poli	29 connect multiple (3)
30 Batterie 12V 4Ah	30 battery 12V 4Ah	30 batteria 12V 4Ah	30 batterie 12V 4Ah
31 2-pol Stecker	31 multip cont plug (2)	31 connettore a 2 poli	31 connect multiple (2)
32 Lüfteranschluss	32 fan connection	32 connett ventilatore	32 connect ventilateur

Deutsch	Englisch	Italienisch	Französisch	Spanisch
bl blau	bl blue	bl blu	bl bleu	bl azul
br braun	br brown	br marrone	br brun	br marron
ge gelb	ge yellow	ge giallo	ge jaune	ge amarillo
gr grau	gr grey	gr grigio	gr gris	gr gris
g grün	g green	g verde	g vert	g verde
o orange	o orange	o arancione	o orange	o naranja
r rot	r red	r rosso	r rouge	r rojo
s schwarz	s black	s nero	s noir	s negro
v violett	v violet	v violetto	v violet	v violeta
w weiß	w white	w bianco	w blanc	w blanco

Start- Notaus- Schalter

Domino	o	s-ge	bl	s	s-w

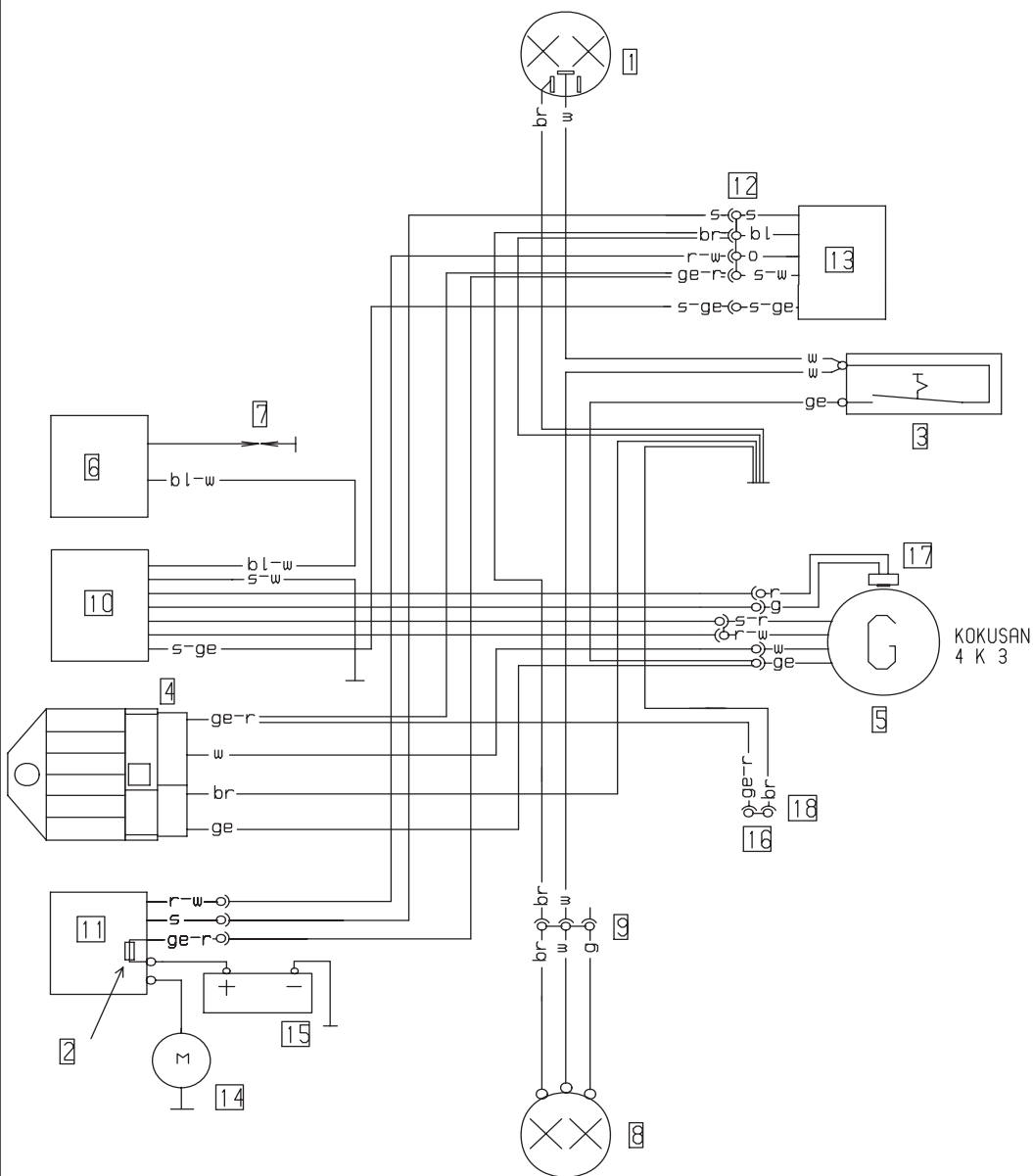
Blinkerschalter

	s	o	v

Kontaktbelegung -
Lichtschalter (Typ CEV 9610)

	g	bl	ge	w	s/ge	r	br
Lights							
LO beam							
Hi beam							
Horn							
Engine off							
	5	2	1	3	6	4	

Spanisch
1 faro
2 luz de posicion
3 interm izquierdo delantero
4 intermitente derecho delantero
5 luz tacometro
6 lampara aviso luces largas
7 lampara aviso intermitentes
8 conector multiple (4)
9 boton de arr par de urg
10 interruptor combinado
11 interr luz de freno del
12 interr luz de fren tras
13 claxon
14 conjunto del intermitente
15 unidad cdi
16 bujia
17 bobina de encendido
18 generador
19 generado de impulsos
20 regulador de tension
21 rele de arranque
22 fusible principal 10A
23 conector multiple (6)
24 intermitente izquierdo trasero
25 intermitente derecho trasero
26 luz de freno trasero
27 interruptor clignoteur
28 motor de arranque
29 conector multiple (3)
30 batteria 12V 4Ah
31 conector multiple (2)
32 conector ventilador



Deutsch	Englisch	Italienisch	Französisch
1 Scheinwerfer	1 headlight	1 faro	1 phare
2 Stecksicherung 10A	2 fuse 10 A	2 fusibile 10A	2 fusible 10A
3 Lichtschalter	3 light switch	3 interr della luce	3 interr d'eclairage
4 Spannungsbegrenzer	4 voltage limiter	4 regol di tens	4 regulateur
5 Generator	5 generator	5 dinamo	5 generateur
6 Zündspule	6 ignition coil	6 bobina d'accens	6 bobine d'allumage
7 Zündkerze	7 spark plug	7 candela	7 bougie
8 Schlußlicht	8 rearlight	8 fanale posteriore	8 feu arriere
9 3-pol Stecker	9 multip cont plug (3)	9 connettore a 3 poli	9 connect multiple (3)
10 CDI-Einheit	10 CDI-unit	10 CDI-seatola	10 CDI-unite
11 Startrelais	11 starter relay	11 rele d'avviamento	11 relais de demarreur
12 4-pol Stecker	12 multip cont plug (4)	12 connettore a 4 poli	12 connect multiple (4)
13 Start/Not Aus	13 startsw /run off	13 disinteritor/partire	13 ba de dem/arr d'urg
14 Startermotor	14 starter engine	14 mot d'avviamento	14 demarreur electrique
15 Batterie 12V 4Ah	15 battery 12V 4Ah	15 batteria 12V 4Ah	15 batterie 12V 4Ah
16 Lüfteranschluss	16 fan connection	16 connett ventilatore	16 connect ventilateur
17 Impulsgeber	17 pulser coil	17 trasmett d'impulsi	17 generateur d'impuls
18 2-pol Stecker	18 multip cont plug (2)	18 connettore a 2 poli	18 connect multiple (2)

bl blau	bl blue	bl blu	bl bleu
br braun	br brown	br marrone	br brun
ge gelb	ge yellow	ge giallo	ge jaune
gr grau	gr grey	gr grigio	gr gris
g grün	g green	g verde	g vert
o orange	o orange	o arancione	o orange
r rot	r red	r rosso	r rouge
s schwarz	s black	s nero	s noir
v violett	v violet	v violetto	v violet
w weiß	w white	w bianco	w blanc

Start- Notaus- Schalter

Domino	o	s-ge	bl	s	s-w

Spanisch

1 faro
2 fusible prin 10A
3 interruptor d'luz
4 regulador de tension
5 generador
6 bobina de encendido
7 bujia
8 luz de trasera
9 conect multiple (3)
10 unidad cdi
11 rele de arranque
12 conect multiple (4)
13 bott de arr par de u
14 motor de arranque
15 batteria 12V 4Ah
16 conector ventilador
17 generado de tension
18 conector multiple(2)

bl azul
br marron
ge amarillo
gr gris
g verde
o naranja
r rojo
s negro
v violeta
w blanco

MXC without lights



SERVICE

Modell

250/400/520 MXC, EXC RACING 2002

Kabelstrangnummer

vorne 590 11 075 300
hinten 503 11 076 000

Land

USA

Datum, Name

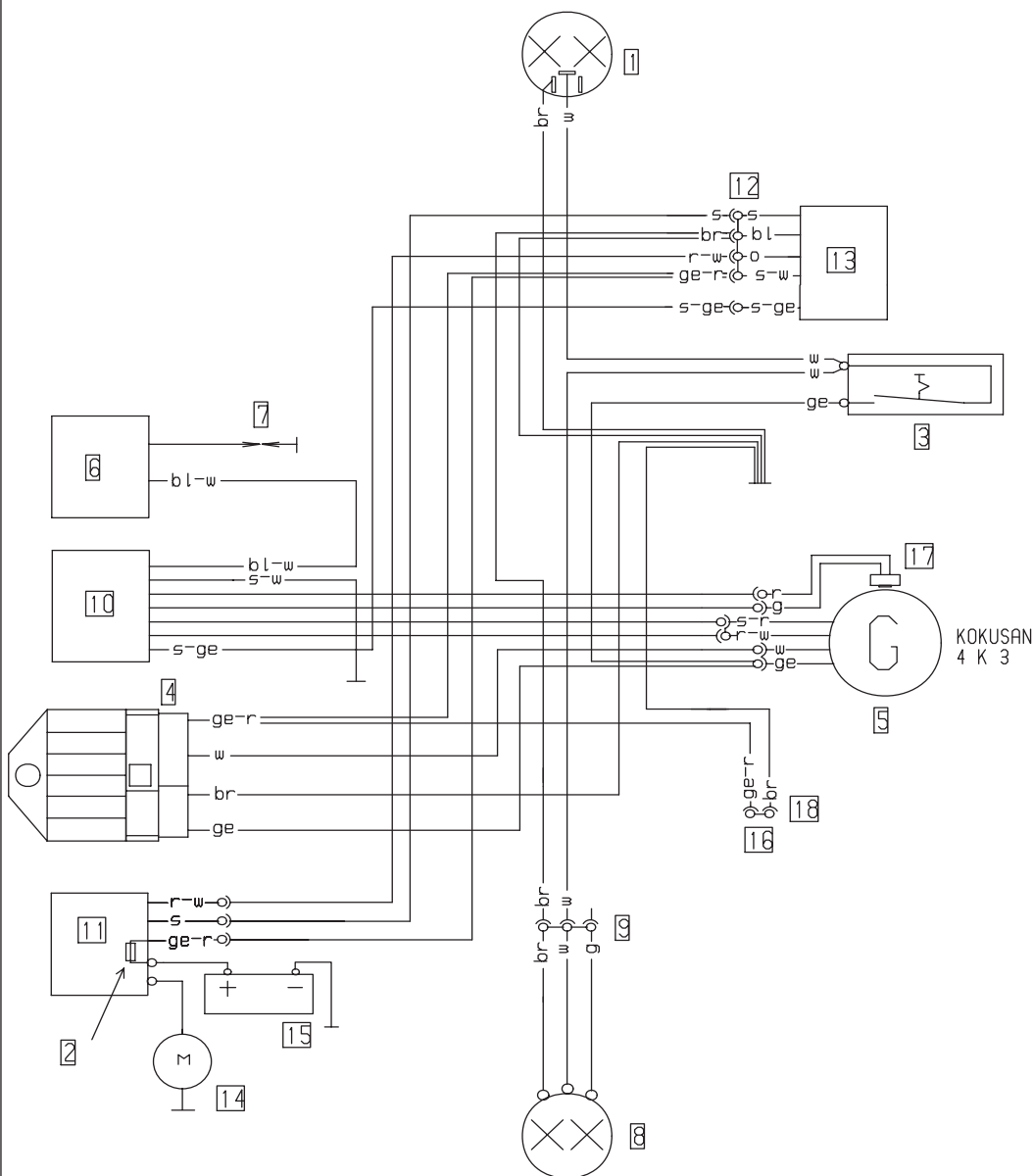
08.05.00 KE

Zeichnungsnr

RAC01USA

Änderungsstand

Kabelstrangbez

vo 4T-Racing 2001
hi 125-380 EXC '98

Deutsch	Englisch	Italianisch	Französisch
1 Scheinwerfer	1 headlight	1 faro	1 phare
2 Stecksicherung 10A	2 fuse 10 A	2 fusibile 10A	2 fusible 10A
3 Lichtschalter	3 light switch	3 interr della luce	3 interr d'eclairage
4 Spannungsbegrenzer	4 voltage limiter	4 regol di tens	4 regulateur
5 Generator	5 generator	5 dinamo	5 generateur
6 Zündspule	6 ignition coil	6 bobina d'accens	6 bobine d'allumage
7 Zündkerze	7 spark plug	7 candela	7 bougie
8 Schlußlicht	8 rearlight	8 fanale posteriore	8 feu arriere
9 3-pol Stecker	9 multip cont plug (3)	9 connettore a 3 poli	9 connect multiple (3)
10 CDI-Einheit	10 CDI-unit	10 CDI-seatola	10 CDI-unite
11 Startrelais	11 starter relay	11 rele d'avviamento	11 relais de demarreur
12 4-pol Stecker	12 multip cont plug (4)	12 connettore a 4 poli	12 connect multiple (4)
13 Start/Not Aus	13 startsw /run off	13 disinteritor/partire	13 ba de dem/arr d'urg
14 Startermotor	14 starter engine	14 mot d'avviamento	14 demarreur electrique
15 Batterie 12V 4Ah	15 battery 12V 4Ah	15 batteria 12V 4Ah	15 batterie 12V 4Ah
16 Lüfteranschluss	16 fan connection	16 connectt ventilatore	16 connect ventilateur
17 Impulsgeber	17 pulser coil	17 trasmett d'impulsi	17 generateur d'impuls
18 2-pol Stecker	18 multip cont plug (2)	18 connettore a 2 poli	18 connect multiple (2)

bl blau	bl blue	bl blu	bl bleu
br braun	br brown	br marrone	br brun
ge gelb	ge yellow	ge giallo	ge jaune
gr grau	gr grey	gr grigio	gr gris
g grün	g green	g verde	g vert
o orange	o orange	o arancione	o orange
r rot	r red	r rosso	r rouge
s schwarz	s black	s nero	s noir
v violett	v violet	v violetto	v violet
w weiß	w white	w bianco	w blanc

Start- Notaus- Schalter

Domino	o	s-ge	bl	s	s-w
□			•		
— ⊗		•	•		
⚡ (⊕)	•				•

Spanisch

1 faro
2 fusible prin 10A
3 interruptor d'luz
4 regulador de tension
5 generador
6 bobina de encendido
7 bujia
8 luz de trasera
9 conect multiple (3)
10 unidad cdi
11 rele de arranque
12 conect multiple (4)
13 batt de arr par de u
14 motor de arranque
15 batteria 12V 4Ah
16 conector ventilador
17 generador de tension
18 conector multiple(2)

bl azul
br marron
ge amarillo
gr gris
g verde
o naranja
r rojo
s negro
v violeta
w blanco

MXC without lights



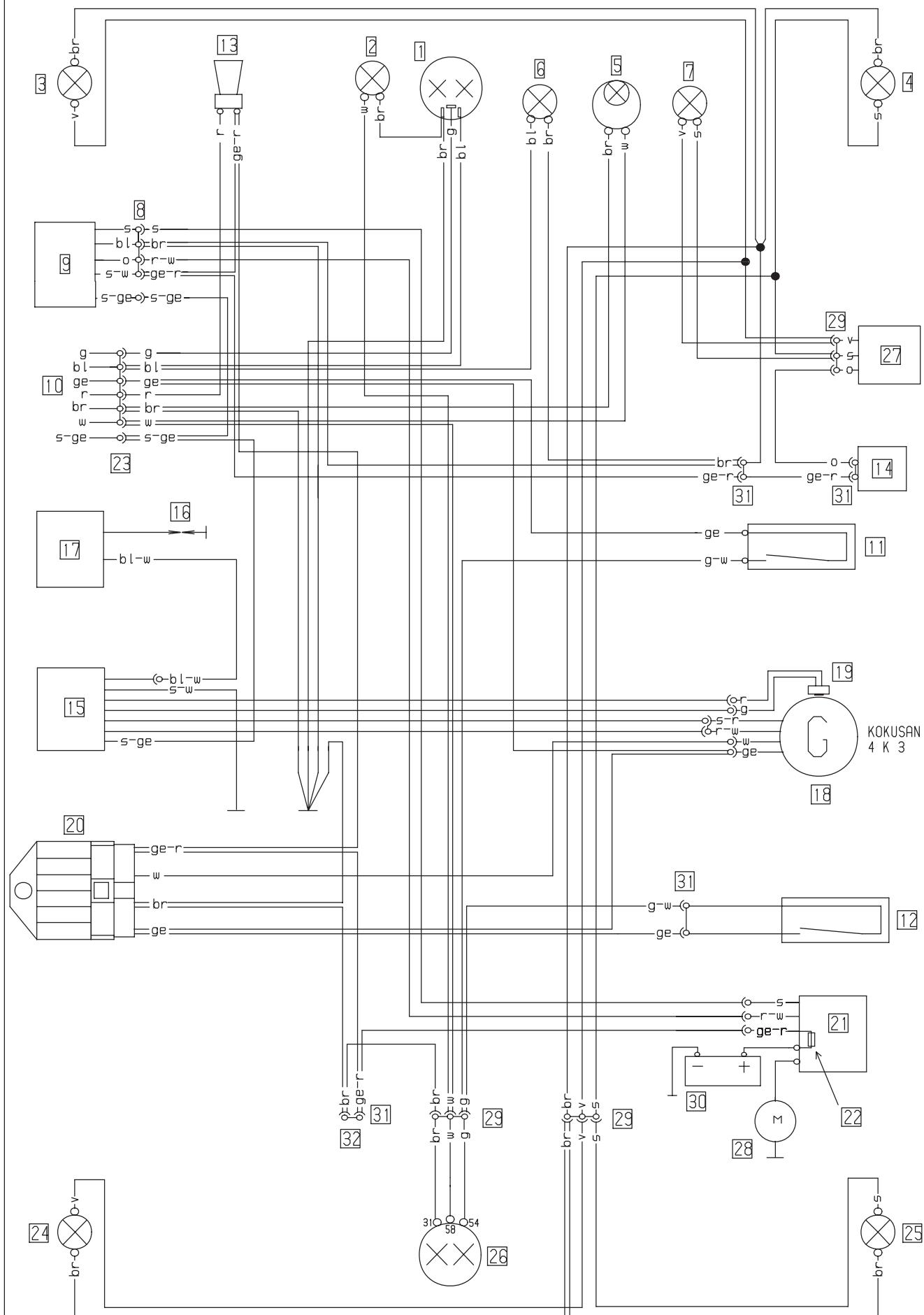
SERVICE

 Modell:
250/400/520 EXC RACING

 Kabelstrangnummer vorne 590 11 075 400
 hinten 503 14 040 100
 Blinkerstrang vorne 590 11 080 000
 Blinkerstrang hinten 590 11 081 000

 Land
EU, AUS

 Datum, Name
04 05 00 KE

 Dateiname
RAC01AUS


250/400/520 EXC RACING 2002

Deutsch	Englisch	Italienisch	Französisch
1 Scheinwerfer	1 headlight	1 faro	1 phare
2 Standlicht	2 position light	2 luce di posizione	2 feu de position
3 Blinker li vo	3 turn indic left fr	3 lampegg ant sn	3 clignoteur av gauche
4 Blinker re vo	4 turn indic right fr	4 lampegg ant dx	4 clignoteur av droit
5 Tachobeuchtung	5 speedometer light	5 luce di tachimetro	5 éclair comp vitesse
6 Fernlichtkontrolle	6 high beam indicator	6 spia abbagliante	6 témoin feu route
7 Blinkerkontrolle	7 turn indicator	7 spia lampeggiatori	7 témoin de clignoteur
8 4-pol Stecker	8 multip cont plug (4)	8 connettore a 4 poli	8 connect multiple (4)
9 Start / Not Aus	9 startsw /run-off	9 disinteritor/partire	9 ba de dem /arr d'urg
10 zum Kombischalter	10 to combinat switch	10 multicomando	10 commodo
11 Bremslichtsch vo	11 stoplight switch f	11 int luce arresto ant	11 contact de stop av
12 Bremslichtsch hi	12 stoplight switch r	12 int luce arresto post	12 contact Harr de stop
13 Horn	13 horn	13 clacson	13 klaxon
14 Blinkgeber	14 turn indicator	14 trasmett di lampeg	14 centrale clignot
15 CDI-Einheit	15 CDI-unit	15 CDI-seatola	15 boitier CDI
16 Zündkerze	16 spark plug	16 candela	16 bougie
17 Zündspule	17 ignition coil	17 bobina d'accens	17 bobine d'allumage
18 Generator	18 generator	18 dinamo	18 generateur
19 Impulsgeber	19 pulser coil	19 trasmett d'impuls	19 generateur d'impuls
20 Spannungsregler	20 voltage regulator	20 regol di tens	20 regulateur
21 Startrelais	21 starter relay	21 rele d'avviamento	21 relais de demarreur
22 Stecksicherung 10A	22 fuse 10A	22 fusibile 10A	22 fusible 10A
23 6-pol Stecker	23 multip cont plug (6)	23 connettore a 6 poli	23 connect multiple (6)
24 Blinker li hi	24 blinker left rear	24 lampegg post sn	24 clign arr gauche
25 Blinker re hi	25 blinker right rear	25 lampegg post dx	25 clign arr droite
26 Brems-Schlußlicht	26 rear-stoplight	26 fanal post di freno	26 feu arr et de stop
27 Blinkerschalter	27 blink switch	27 int lampeggiatori	27 contact d clignoteur
28 Startermotor	28 starter engine	28 mot d'avviamento	28 demrreur electrique
29 3-pol Stecker	29 multip cont plug (3)	29 connettore a 3 poli	29 connect multiple (3)
30 Batterie 12V 4Ah	30 battery 12V 4Ah	30 batteria 12V 4Ah	30 batterie 12V 4Ah
31 2-pol Stecker	31 multip cont plug (2)	31 connettore a 2 poli	31 connect multiple (2)
32 Lüfteranschluss	32 fan connection	32 connett ventilatore	32 connect ventilateur

Deutsch	Englisch	Italienisch	Französisch	Spanisch
bl blau	bl blue	bl blu	bl bleu	bl azul
br braun	br brown	br marrone	br brun	br marron
ge gelb	ge yellow	ge giallo	ge jaune	ge amarillo
gr grau	gr grey	gr grigio	gr gris	gr gris
g grün	g green	g verde	g vert	g verde
o orange	o orange	o arancione	o orange	o naranja
r rot	r red	r rosso	r rouge	r rojo
s schwarz	s black	s nero	s noir	s negro
v violett	v violet	v violetto	v violet	v violeta
w weiß	w white	w bianco	w blanc	w blanco

Spanisch
1 faro
2 luz de posicion
3 interm izquierdo delantero
4 intermitente derecho delantero
5 luz tacometro
6 lampara aviso luces largas
7 lampara aviso intermitentes
8 conector multiple (4)
9 boton de arr par de urg
10 interruptor combinado
11 interr luz de freno del
12 interr luz de fren tras
13 claxon
14 conjunto del intermitente
15 unidad cdi
16 bujia
17 bobina de encendido
18 generador
19 generado de impulsos
20 regulador de tension
21 rele de arranque
22 fusible principal 10A
23 conector multiple (6)
24 intermitente izquierdo trasero
25 intermitente derecho trasero
26 luz de freno trasero
27 interruptor clignoteur
28 motor de arranque
29 conector multiple (3)
30 batteria 12V 4Ah
31 conector multiple (2)
32 conector ventilador

Start- Notaus- Schalter

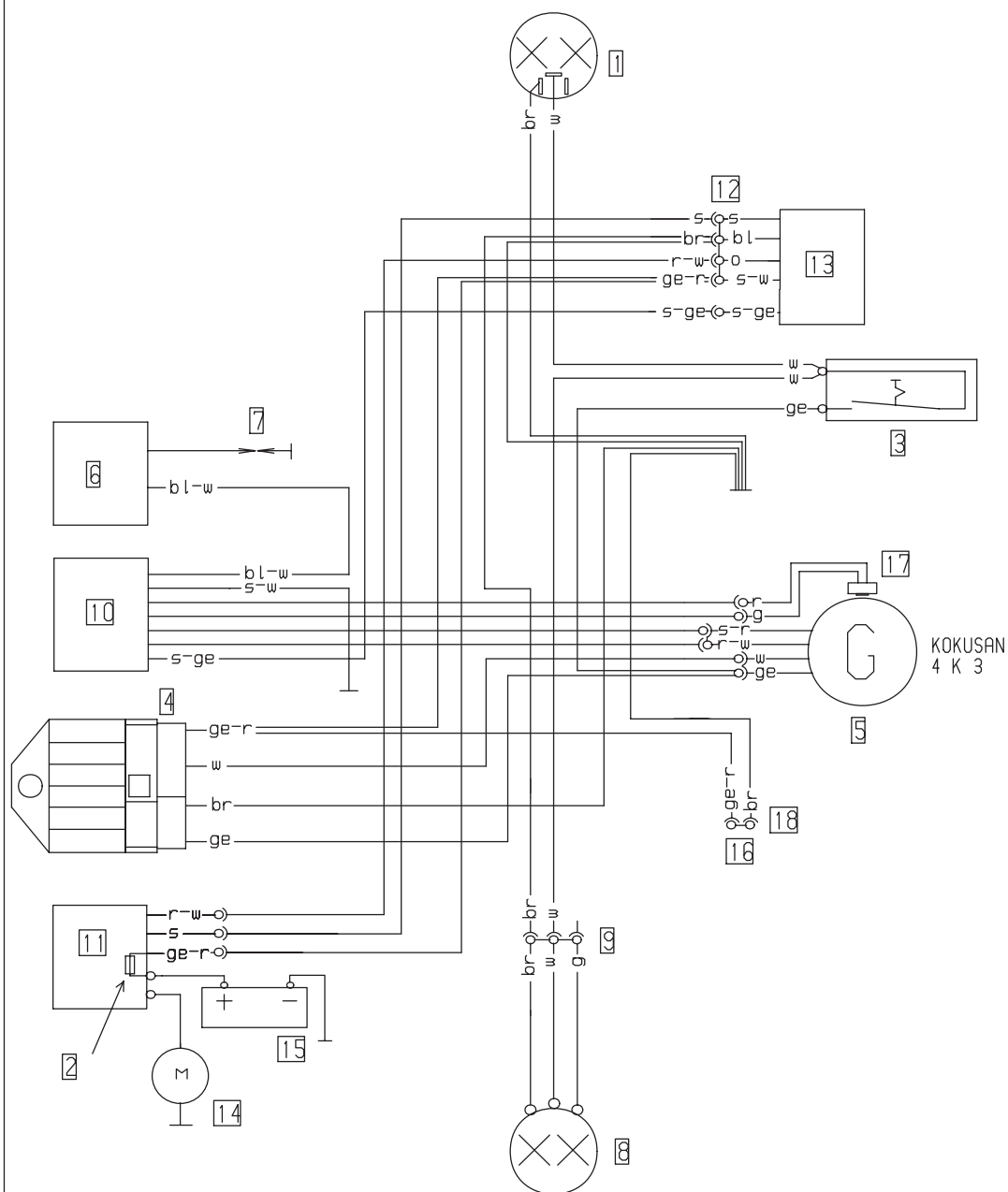
Domino	o	s-ge	bl	s	s-w

Blinkerschalter

	s	o	v

Kontaktbelegung -
Lichtschalter (Typ CEV 9610)

	g	bl	ge	w	s/ge	r	br
Lights							
LO beam							
Hi beam							
Horn							
Engine off							
	5	2	1	3	6	4	



Deutsch	Englisch	Italienisch	Französisch
1 Scheinwerfer	1 headlight	1 faro	1 phare
2 Stecksicherung 10A	2 fuse 10 A	2 fusibile 10A	2 fusible 10A
3 Lichtschalter	3 light switch	3 interr della luce	3 interr d' eclairage
4 Spannungsbegrenzer	4 voltage limiter	4 regol di tens	4 regulateur
5 Generator	5 generator	5 dinamo	5 generateur
6 Zündspule	6 ignition coil	6 bobina d'accens	6 bobine d'allumage
7 Zündkerze	7 spark plug	7 candela	7 bougie
8 Schlußlicht	8 rearlight	8 fanale posteriore	8 feu arriere
9 3-pol Stecker	9 multip cont plug (3)	9 connettore a 3 poli	9 connect multiple (3)
10 CDI-Einheit	10 CDI-unit	10 CDI-seatola	10 CDI-unite
11 Startrelais	11 starter relay	11 rele d'avviamento	11 relais de demarreur
12 4-pol Stecker	12 multip cont plug (4)	12 connettore a 4 poli	12 connect multiple (4)
13 Start/Not Aus	13 startsw /run off	13 disinteritor/partire	13 ba de dem/arr d'urg
14 Startermotor	14 starter engine	14 mot d'avviamento	14 demarreur electrique
15 Batterie 12V 4Ah	15 battery 12V 4Ah	15 batteria 12V 4Ah	15 batterie 12V 4Ah
16 Lüfteranschluss	16 fan connection	16 connett ventilatore	16 connect ventilateur
17 Impulsgeber	17 pulser coil	17 trasmett d'impulsi	17 generateur d'impuls
18 2-pol Stecker	18 multip cont plug (2)	18 connettore a 2 poli	18 connect multiple (2)

bl blau	bl blue	bl blu	bl bleu
br braun	br brown	br marrone	br brun
ge gelb	ge yellow	ge giallo	ge jaune
gr grau	gr grey	gr grigio	gr gris
g grün	g green	g verde	g vert
o orange	o orange	o arancione	o orange
r rot	r red	r rosso	r rouge
s schwarz	s black	s nero	s noir
v violett	v violet	v violetto	v violet
w weiß	w white	w bianco	w blanc

Start- Notaus- Schalter

Domino	o	s-ge	bl	s	s-w

Spanisch

1 faro
2 fusible prin 10A
3 interruptor d'luz
4 regulador de tension
5 generador
6 bobina de encendido
7 bujia
8 luz de trasera
9 conect multiple (3)
10 unidad cdi
11 rele de arranque
12 conect multiple (4)
13 bott de arr par de u
14 motor de arranque
15 batteria 12V 4Ah
16 conector ventilador
17 generador de tension
18 conector multiple(2)

bl azul
br marron
ge amarillo
gr gris
g verde
o naranja
r rojo
s negro
v violeta
w blanco

MXC without lights

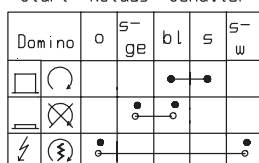
250/450/525 EXC RACING 2003 EU, AUS

Deutsch	Englisch	Italienisch	Französisch
1 Scheinwerfer	1 headlight	1 faro	1 phare
2 Standlicht	2 position light	2 luce di posizione	2 feu de position
3 Blinker li vo	3 turn indic.left fr.	3 lampegg.ant.sn.	3 clignoteur av gauche
4 Blinker re vo	4 turn indic.right fr.	4 lampegg.ant.dx.	4 clignoteur av droit
5 Tacho	5 speedometer	5 tachimetro	5 compteur vitesse
6 Fernlichtkontrolle	6 high beam indicator	6 spia abbagliante	6 témoin feu route
7 Blinkerkontrolle	7 turn indicator	7 spia lampeggiatori	7 témoin de clignoteur
8 4-pol. Stecker	8 multip.cont.plug (4)	8 connettore a 4 poli	8 connect.multiple (4)
9 Start / Not Aus	9 startsw./run-off	9 disinteritor/partire	9 ba.de.dem./arr.d'urg
10 zum Kombischalter	10 to combinat. switch	10 multicomando	10 comodo
11 Bremslichtsch. vo	11 stoplight switch f.	11 int.luce arresto ant	11 contact de stop av.
12 Bremslichtsch. hi	12 stoplight switch r.	12 int.luce arresto post	12 contact Harr.de stop
13 Horn	13 horn	13 clacson	13 klaxon
14 Blinkgeber	14 turn indicator	14 trasmett. di lampeg.	14 centrale clignot.
15 CDI-Einheit	15 CDI-unit	15 CDI-seatola	15 boitier CDI
16 Zündkerze	16 spark plug	16 candela	16 bougie
17 Zündspule	17 ignition coil	17 bobina d'accens.	17 bobine d'allumage
18 Generator	18 generator	18 dinamo	18 generateur
19 Impulsgeber	19 pulser coil	19 trasmett d'impulsi	19 generateur d'impuls
20 Spannungsregler	20 voltage regulator	20 regol. di tens.	20 regulateur
21 Startrelais	21 starter relay	21 rele d'avviamento	21 relais de demarreur
22 Stecksicherung 10A	22 fuse 10A	22 fusibile 10A	22 fusible 10A
23 6-pol. Stecker	23 multip.cont.plug (6)	23 connettore a 6 poli	23 connect.multiple (6)
24 Blinker li hi	24 blinker left rear	24 lampegg.post.sn	24 clign.arr.gauche
25 Blinker re hi	25 blinker right rear	25 lampegg.post.dx.	25 clign.arr.droite
26 Brems-Schlußlicht	26 rear-stoplight	26 fanal.post.di freno	26 feu arr.et de stop
27 Blinkerschalter	27 blink switch	27 int. lampeggiatori	27 contact.d.clignoteur
28 Startermotor	28 starter engine	28 mot.d'avviamento	28 demrreur electrique
29 3-pol. Stecker	29 multip.cont.plug (3)	29 connettore a 3 poli	29 connect.multiple (3)
30 Batterie 12V 4Ah	30 battery 12V 4Ah	30 batteria 12V 4Ah	30 batterie 12V 4Ah
31 2-pol. Stecker	31 multip.cont.plug (2)	31 connettore a 2 poli	31 connect.multiple (2)
32 Lüfteranschluss	32 fan connection	32 connett.ventilatore	32 connect.ventilateur

Deutsch	Englisch	Italienisch	Französisch	Spanisch
bl blau	bl blue	bl blu	bl bleu	bl azul
br braun	br brown	br marrone	br brun	br marron
ge gelb	ge yellow	ge giallo	ge jaune	ge amarillo
gr grau	gr grey	gr grigio	gr gris	gr gris
g grün	g green	g verde	g vert	g verde
o orange	o orange	o arancione	o orange	o naranja
r rot	r red	r rosso	r rouge	r rojo
s schwarz	s black	s nero	s noir	s negro
v violett	v violet	v violetto	v violet	v violeta
w weiß	w white	w bianco	w blanc	w blanco

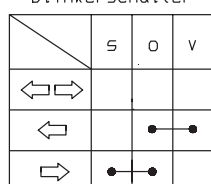
Spanisch
1 faro
2 luz de posicion
3 interm. izquierdo delantero
4 intermitente derecho delantero
5 tacometro
6 lampara aviso luces largas
7 lampara aviso intermitentes
8 conector multiple (4)
9 boton de arr.par.de.urg.
10 interruptor combinado
11 interr. luz de freno del.
12 interr. luz. de fren tras.
13 claxon
14 conjunto del intermitente
15 unidad cdi
16 bujia
17 bobina de encendido
18 generador
19 generado de impulsos
20 regulador de tension
21 rele de arranque
22 fusible principal 10A
23 conector multiple (6)
24 intermitente izquierdo trasero
25 intermitente derecho trasero
26 luz de freno trasero
27 interruptor clignoteur
28 motor de arranque
29 conector multiple (3)
30 batteria 12V 4Ah
31 conector multiple (2)
32 conector ventilador

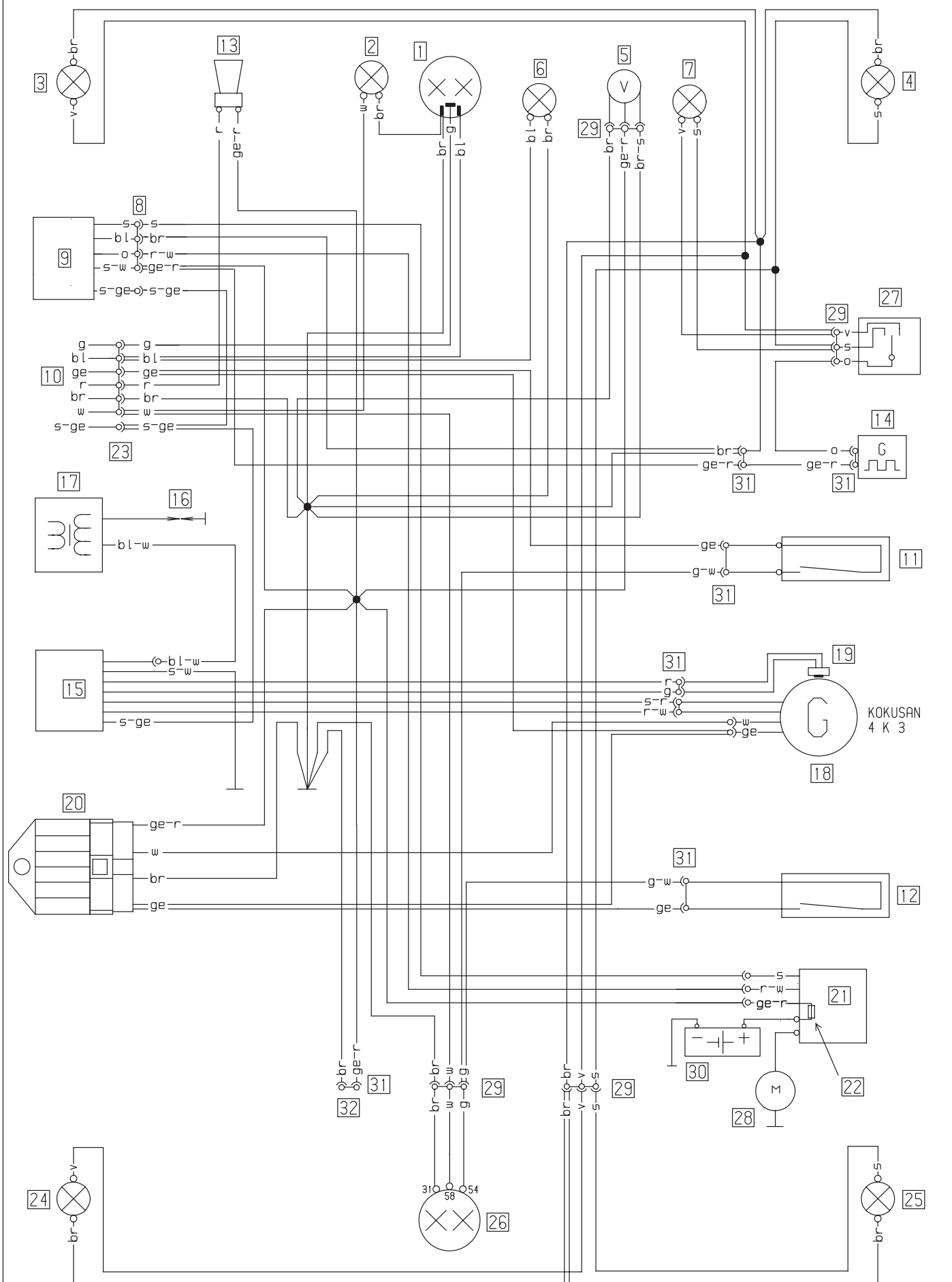
Start- Notaus- Schalter

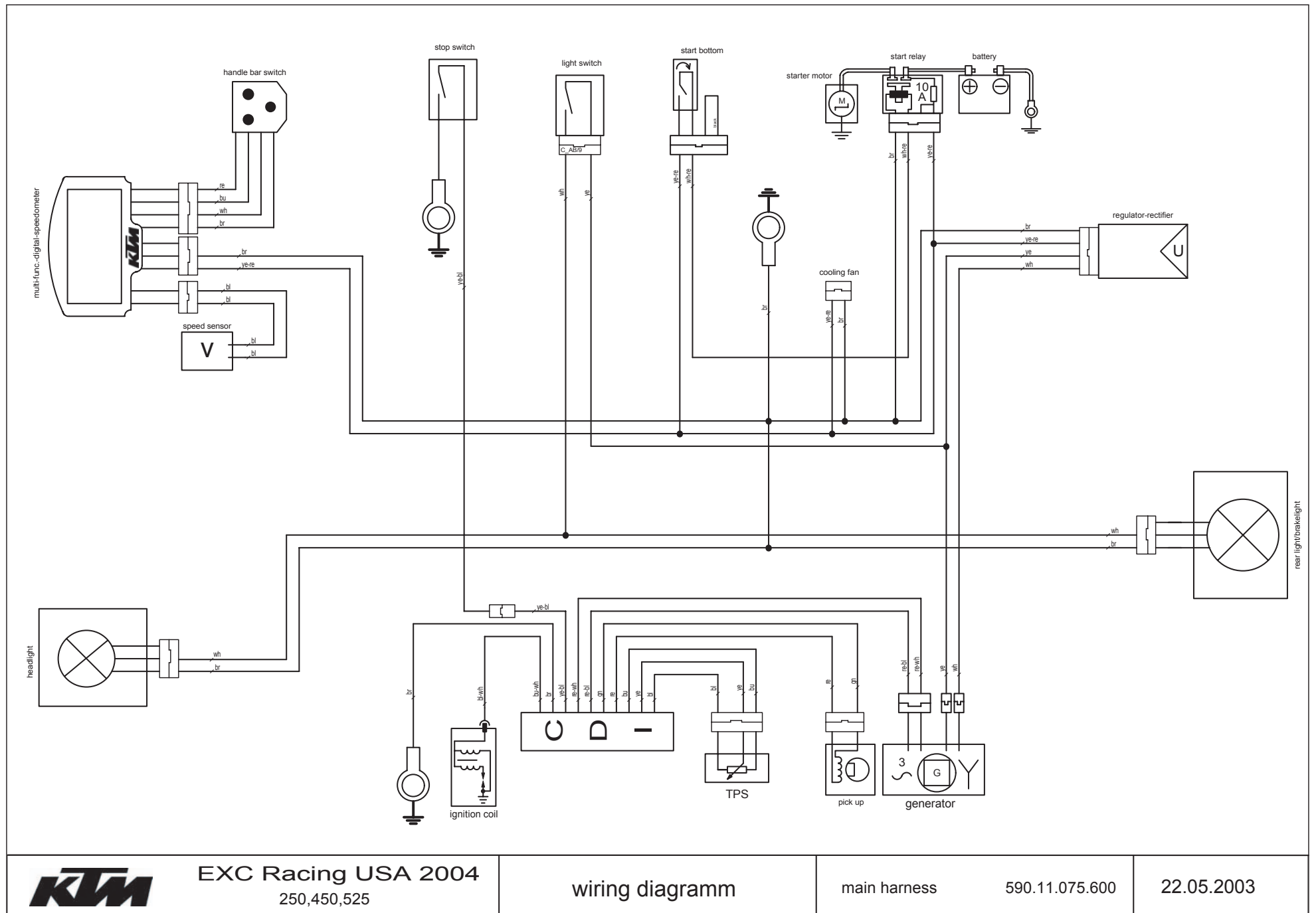
Kontaktbelegung -
Lichtschalter (Typ CEV 9610)

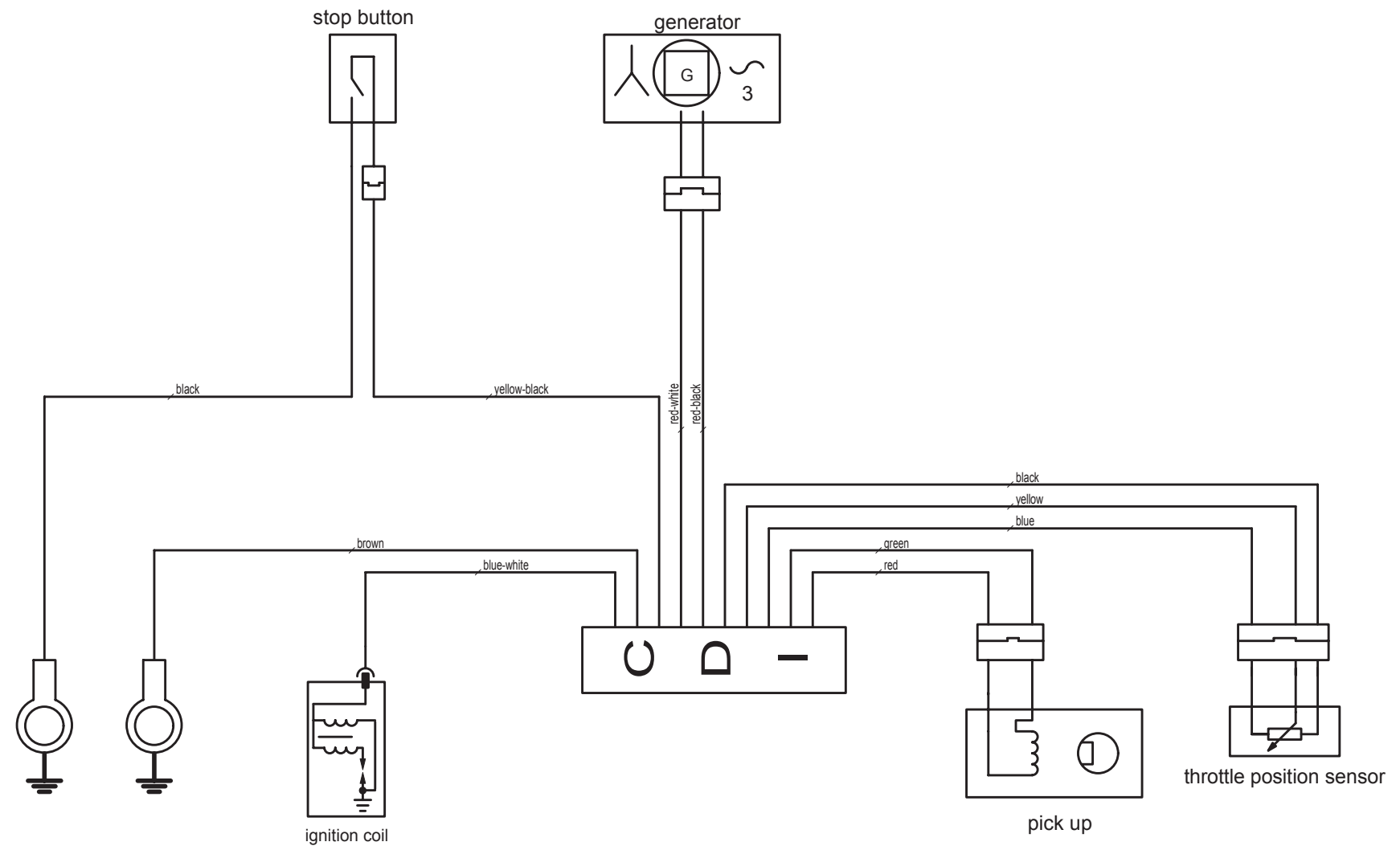
	g	bl	ge	w	s/ge	r	br
Lights	•						
LO beam	•	•	•	•			
Hi beam	•	•	•	•			
Horn						•	•
Engine off					•	•	
	5	2	1	3	6	4	

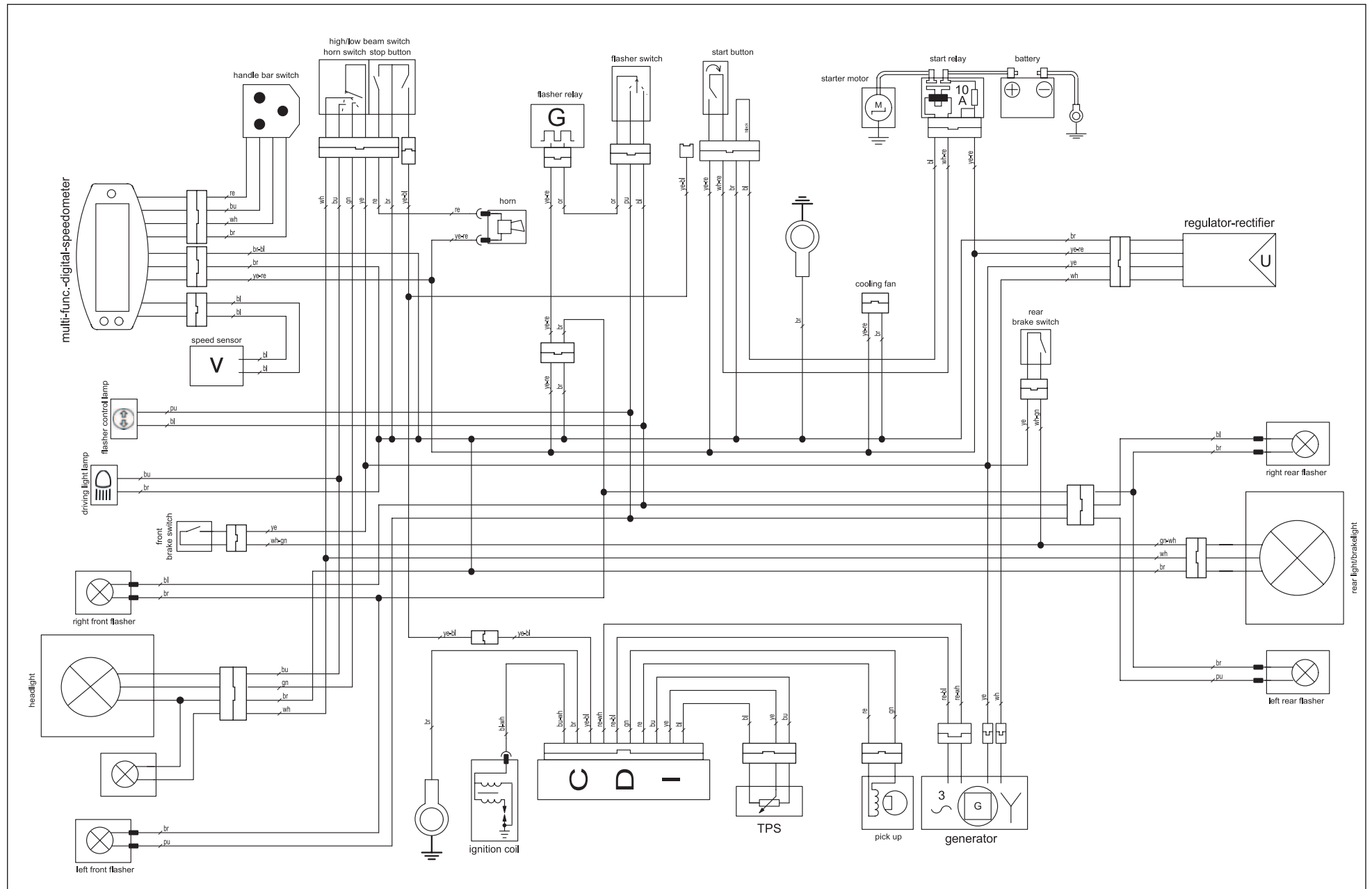
Blinkerschalter











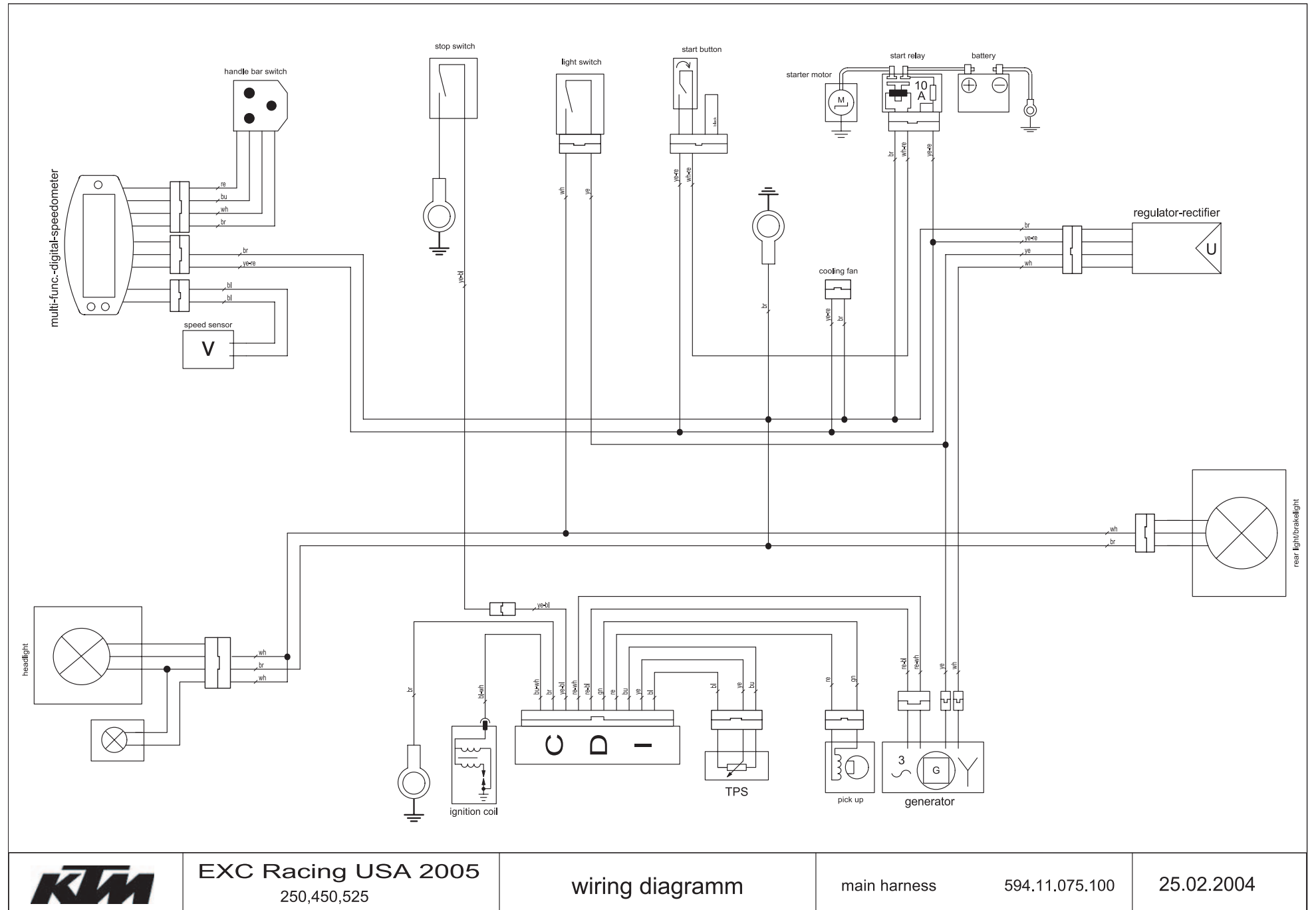
EXC Racing 2005
250,450,525

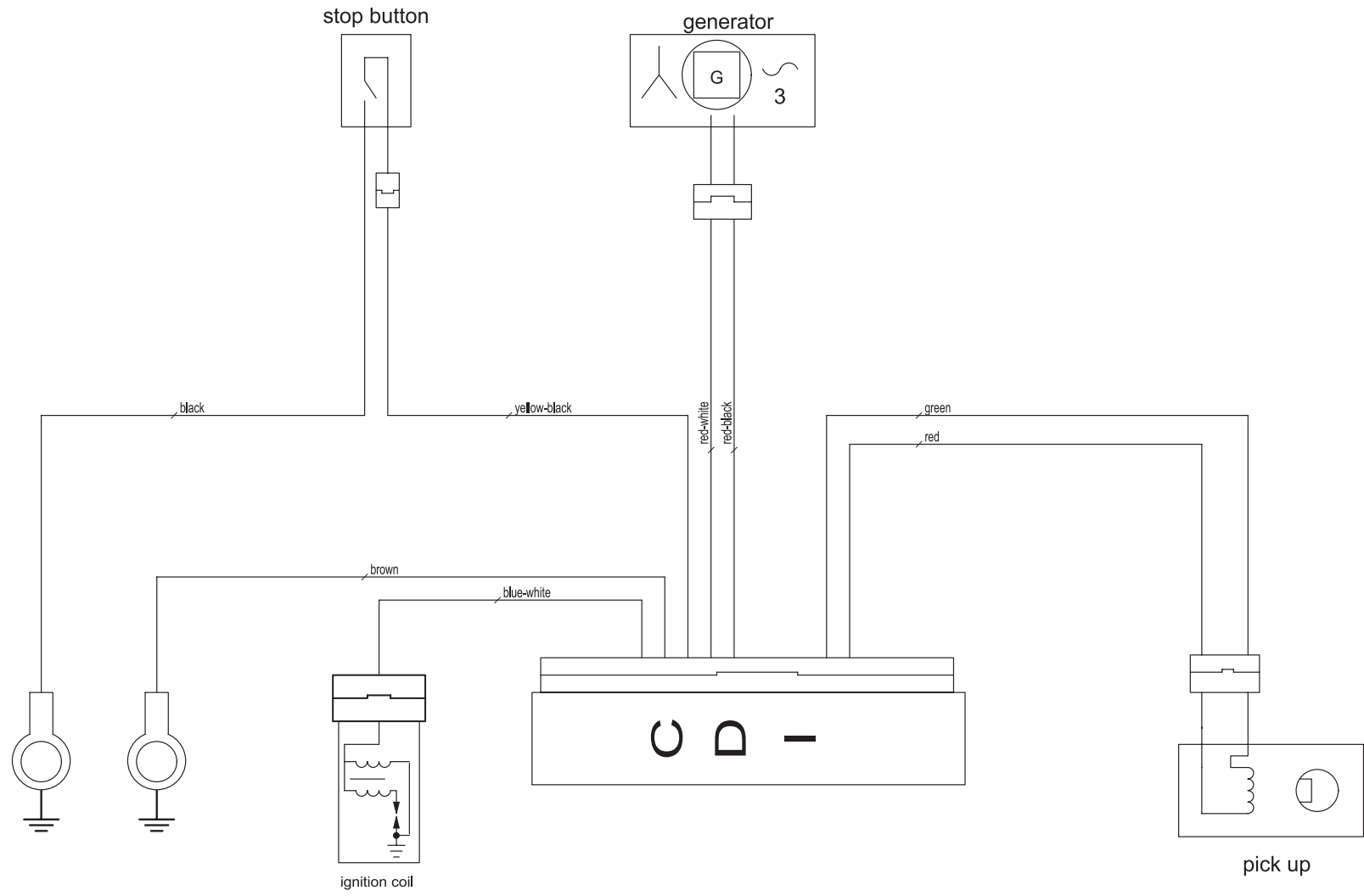
wiring diagramm

main harness

594.11.075.050

05.03.2004





SX, SXS, SMS RACING 2005
450-540

CDI harness - 594.39.032.000

20.02.2004

Cable colours

bl: black

ye: yellow

bu: blue

gn: green

re: red

wh: white

br: brown

or: orange

pi: pink

gr: grey

pu: purple

Product

Exploded View

Disassembly & Assembling



Frontfork

4860 MX Multi Adjuster 2003

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Disassembly compression holder	21
Assembling compression holder	24
Disassembly tap rebound	27
Assembling tap rebound	31
Assembling cartridge	34
Assembling forkleg	37



Introduction

General notice:

Pay attention to the following notes, when you are working with WP Suspension products as described in this workshop manual.

Always use clean and professional tools.

Regular you need next to the general equipment, the special tools of WP Suspension.

These tools with a unique "T" number (available at WP Suspension) protect you from damaging the parts.

Always use aluminium protector-plates, when clamping our products or parts in the vice.

Always replace damaged or worn parts.

Clean all parts before assembling.

Caution:

Many times it is necessary to assemble parts with T131, T132 and T163.

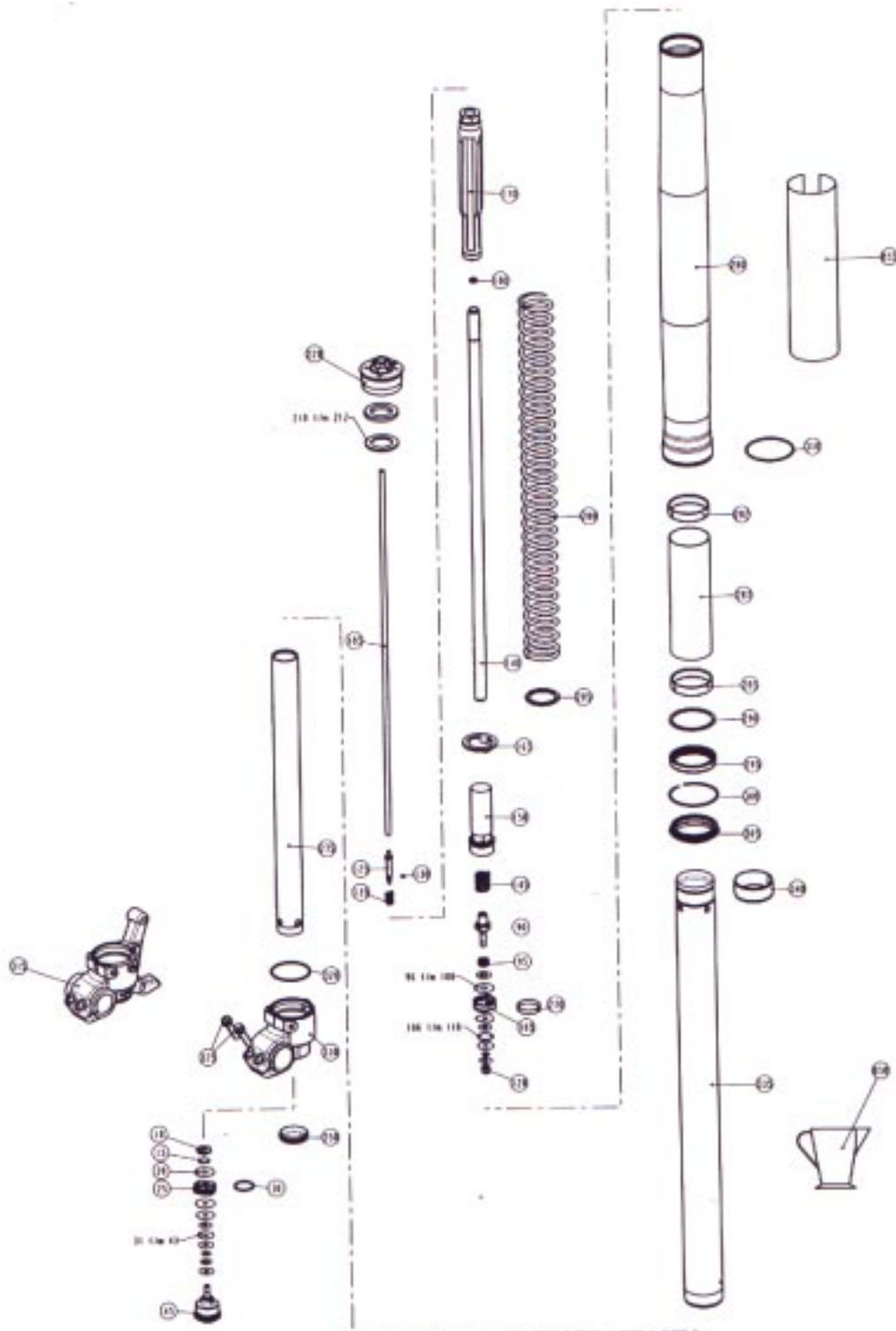
These parts must dry for at least four hours!!

Product

Exploded View

Disassembly & assembling

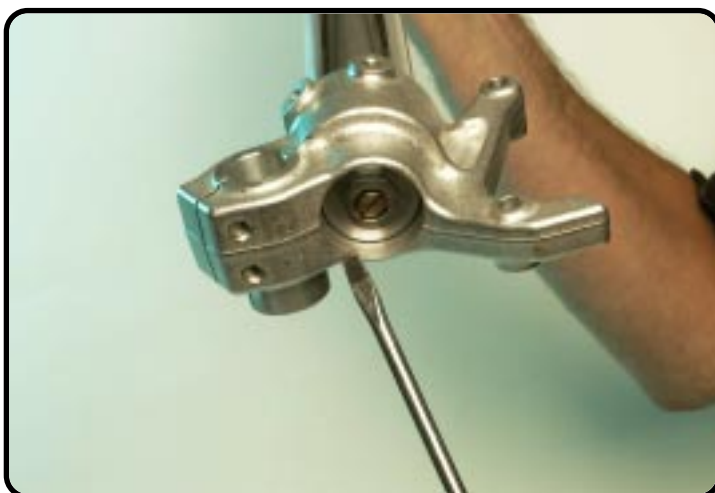
Exploded view



Disassembly forkleg



Note the rebound position by turning the knob to the right.



After removing the rubber cap.
Note the compression position by turning the screw to the right.



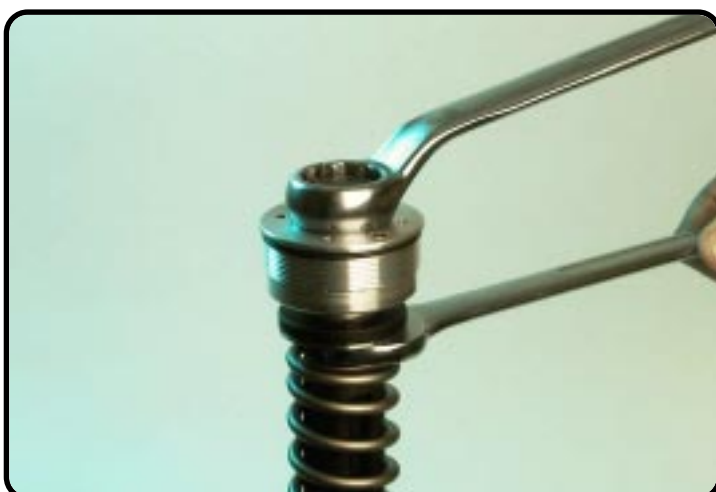
Clamp the outer-tube in T1403S and unscrew the screw-cap PA with T103.



Clamp the forkleg (axle-clamp) in the vice and let the outer-tube down. Pull the spring downwards...



...and place open-end spanner (size 22) on the hydraulic stop.



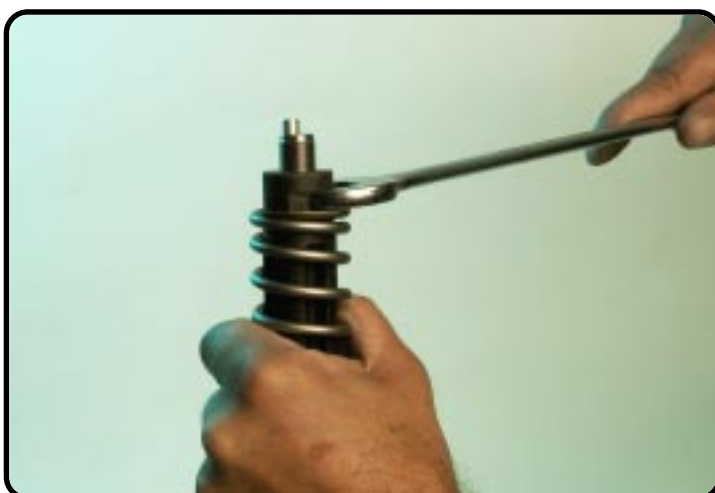
Unscrew the screw-cap.



Remove the screw-cap from the piston-rod.



Remove the preload spacers.



Pull the spring downwards and remove the spanner.



Remove the spring.



Remove the adjustment tube with the O-ring.



Drain the oil out the forkleg.



Clamp the axle-clamp in the vice so that the forkleg is at an angle of ± 45 degrees.



Unscrew the compression holder out of the axle-clamp. (size 19)
(when the cartridge is rotating with the holder, bend the piston-rod a little bit to the side)



Remove holder compression.
Caution: oil is coming out the cartridge.



Disassemble the cartridge out the
forkleg.



Disassemble the dust-wiper.



Disassemble the circlip.



Heat the outer-tube near the oilseal.
(not too hot)



Heat the outer-tube at this level..



Pull with both hands the outer-tube from the inner-tube.



Remove DU-bush inner-tube.



1. Remove DU-bush.



Remove DU-bush inner-tube.



Remove DU-bush outer-tube.



Remove support ring.



Disassemble the oilseal.
Pay attention to the assembling
direction!!!



Remove the circlip.



Remove the dust wiper.



Heat the axle-clamp.



Use T1404S...



...and unscrew the inner-tube from the axle-clamp.



Remove the inner-tube.



Remove the O-ring out the groove of the axle-clamp.

Disassembly cartridge



1. Clamp the tube with plug in the clamping-block (Tool T508S + T509).



2.



3.



Unscrew the screw sleeve (size 22).



Turn the screw sleeve out of the tube.



Disassemble the piston-rod "complete".
Pay attention to the piston ring!!!



Clamp the piston rod in T508S “**not too tight**” and unscrew the hydraulic stop from the piston-rod.



Remove the hydraulic stop.



Remove the screw sleeve with spring retainer.



Disassemble the DU-bush with T507 and press it out the screw sleeve with support of the vice.



- Spring retainer
- screw sleeve
- DU-bush

Disassembly holder compression



Clamp the compression holder in the vice and unscrew the check-valve nut. (size 17)

Version with a locking: remove the locking with a file.



Remove the check-valve nut.



Remove the check-valve spring. Pay attention to the assembling direction!!!



Remove the check-valve shim.



Disassemble the compression piston with O-ring.
Pay attention to the assembling direction!!!



Place a screwdriver on top of the holder and remove the entire shim packet.



Disassemble the O-ring.



Remove the copper washer.



- Holder compression
- copper washer
- O-ring
- shims compression
- piston compression with O-ring
- shim check-valve
- spring check-valve
- nut check-valve

Assembling holder compression

Replace copper washer.



Assemble the O-ring.



Replace the entire shim packet.





Replace piston.
Pay attention to the assembling
direction!!!



Replace shim check-valve.



Replace spring check-valve.
Pay attention to the assembling
direction!!!



Wetting the thread of the nut with T132 and tighten it...



...to a torque of 5Nm.



Check if the spring is correctly placed in the chamber of the nut.

Disassembly tap rebound



Clamp the piston-rod (at the level where the hydraulic stop is mounted) in T508S and unscrew the rebound tap. (Size 17)



Remove the rebound tap "complete".



Remove the rebound spring.



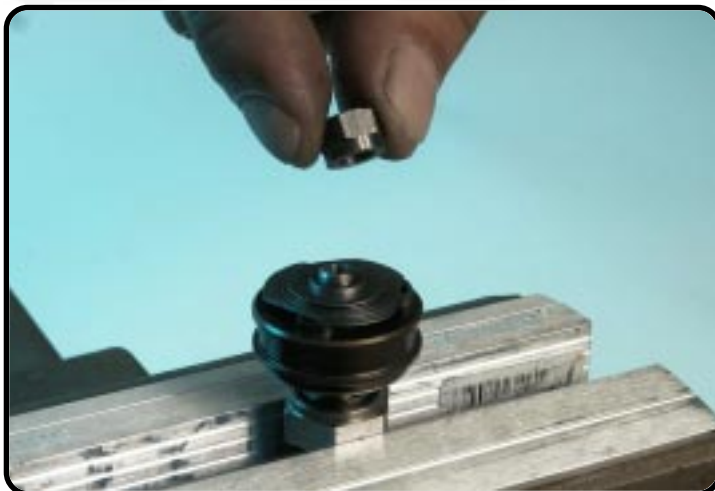
Pull the rebound needle with spring out of the tap rebound.



Check the O-ring.



Pay attention to the position of the triangular shims on the piston!!!
Clamp the tap in the vice and unscrew the nut. (Size 10)
Version with locking: Remove the locking with a file.



Remove the nut.
Pay attention to the assembling
direction!!!



Place a screwdriver on top of the tap
and remove the entire shim packet.



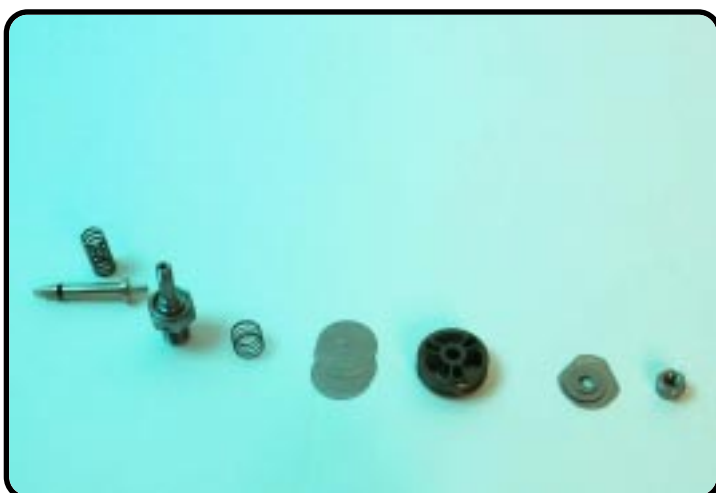
Remove piston rebound.
Pay attention to the assembling
direction!!!



Remove check-valve shims.



Remove spring check-valve.

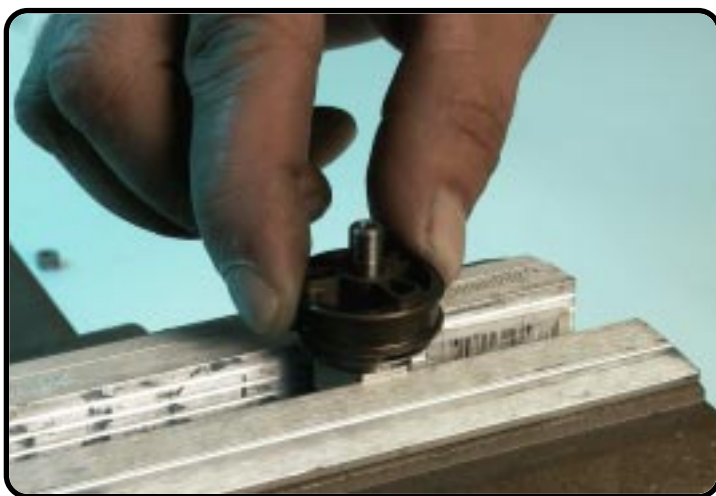


- Rebound adjustment needle with O-ring
- spring
- tap rebound
- spring check-valve
- shims check-valve
- piston rebound
- shims
- nut M6x0.5

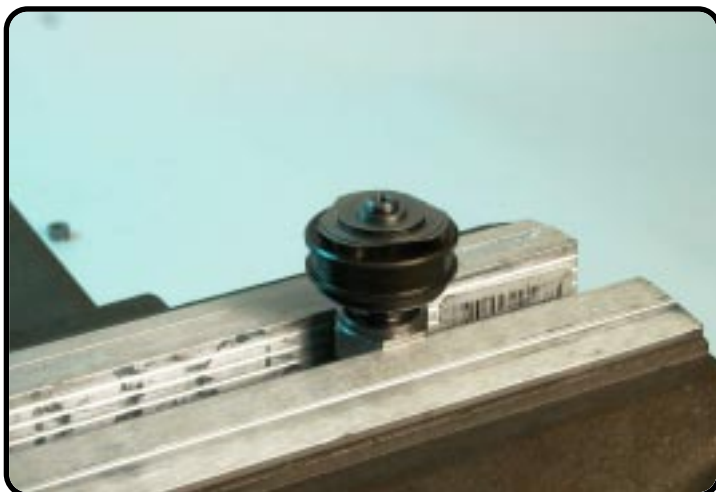
Assembling tap rebound



Assemble the spring and shims check-valve.



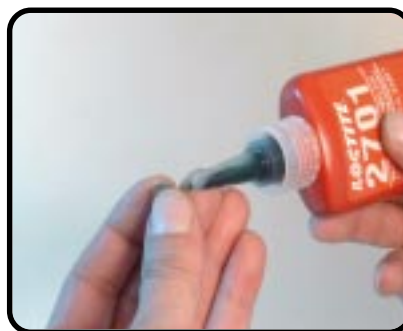
Assemble the piston rebound.
Pay attention to the assembling direction!!!



Replace the shims.
Pay attention to the position of the triangular shims on the piston!!!



Wetting the thread of the nut with T132.
Screw the nut on the tap...



...tighten the nut to a torque of 5 Nm.



Grease the O-ring of the adjustment
needle with T158.



Mount the needle with spring into the tap rebound.

Assembling cartridge



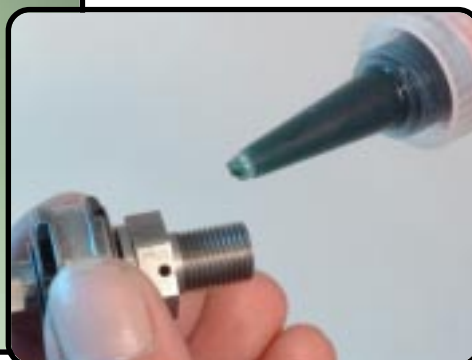
Press with T507 the DU-bush into the screw sleeve.



Clamp the piston-rod in T508S.
At the level where the hydraulic stop is mounted.



Wetting the thread with T131.
And screw the tap in the piston-rod.





Tighten the tap rebound.



Clamp the piston-rod **“not too tight”** in at the other side and replace the screw sleeve with spring retainer.



Screw the hydraulic stop **“hand tight”** to the end of the thread of the piston-rod.



Clamp the tube with plug in the clamping block (T508S and T509) and assemble the piston-rod "cpl." into the tube.
Guide the piston ring!!!



Before assembling wet the thread of the screw sleeve with T131.

Screw the screw sleeve into the tube.



Tighten the screw sleeve.

Assembling forkleg



Replace a new O-ring in the groove of the axle-clamp.



Wetting the thread of the axle-clamp with T132.



Wetting the thread of the inner-tube with T132.



Assemble the inner-tube in the axle-clamp.



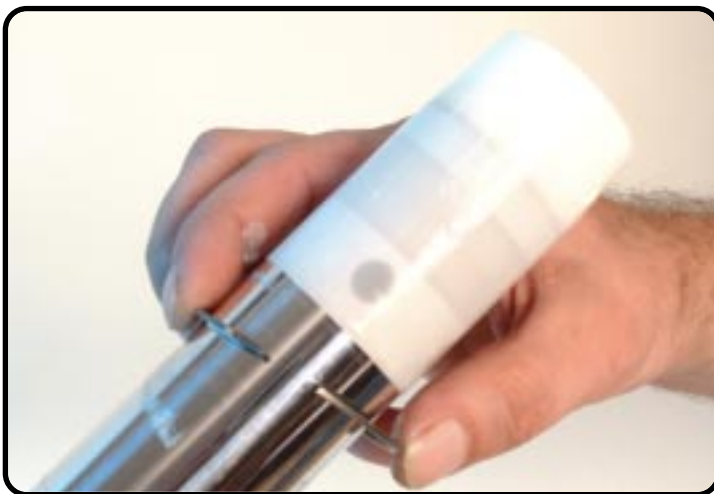
Screw very tight the inner-tube with T503S / T1404S.



Apply the dust wiper with T511.



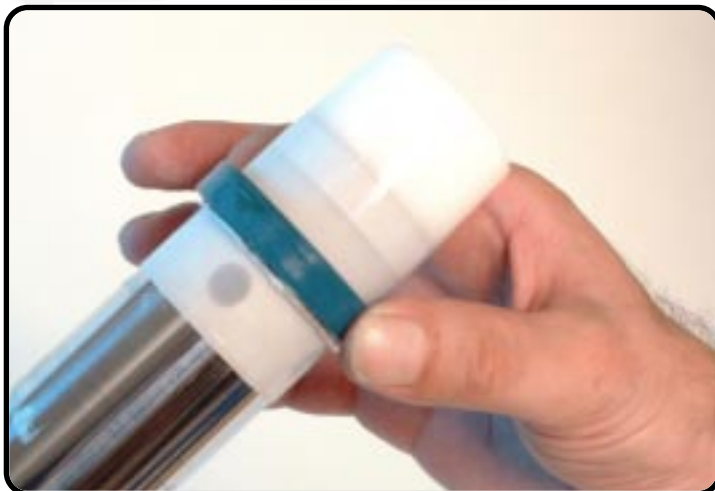
Place T1401 over the inner-tube and assemble the dust wiper.



Replace the circlip.



Apply the innerside of the oilseal with T511 and the outside with frontfork oil.



Assemble the oilseal.
Pay attention to the assembling
direction!!!



Remove the tool and replace the
support ring.



Replace the DU-bush.



Replace the tube.



Replace the DU-bush.



Replace the DU-bush on the inner-tube.



Slide carefully the outer-tube over the inner-tube.



Assemble with T1402S the DU-bush -
with the flat side- and...



...tap or push it into the outer-tube.



Use the other side of T1402S...



...and tap the oilseal into the outer-tube.



Assemble the circlip into the groove of the outer-tube.

Important: Check this very carefully!!!



Assemble the dust wiper with T1402S.



Place the cartridge into the forkleg.



Apply the O-ring of the compression piston with frontfork oil.



Assemble the cartridge in the center of the axle-clamp and tighten the holder compression to a torque of 25Nm.



Assemble the adjustment tube with the O-ring into the piston-rod.



Keep the outer-tube down and the piston-rod a little bit extended (like picture), fill the forkleg with oil till the edge of the outer-tube, wait a few moments, you will see air bubbles rising up.

The oil must stay **above** the 4 holes of the inner-tube, if necessary fill some extra oil in the forkleg.



Move the piston-rod (keep the adjustment tube on his place) several times up and down till you feel that the cartridge is full with oil, (the damping is smooth over the entire stroke) mostly it is necessary to fill some (not too much) extra oil in the forkleg.

Now compress the piston-rod and outer-tube fully down, and fill the forkleg with oil till about 25mm **under** the 4 holes of the inner-tube. Move the piston-rod and the outer-tube at the same time several times up and down over the entire stroke.



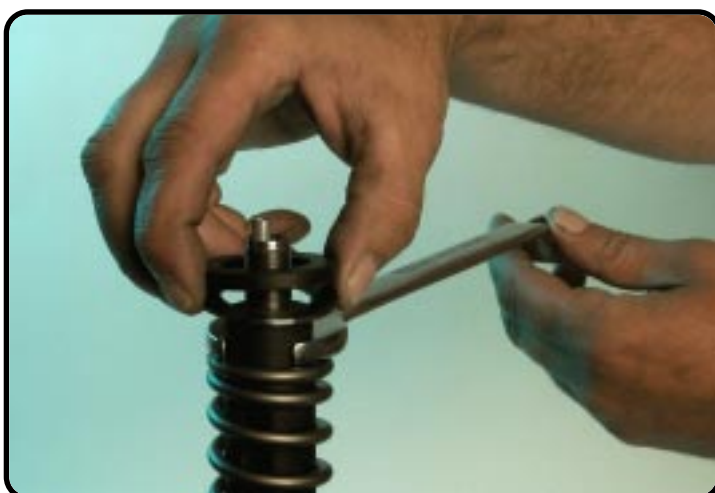
Push the piston-rod and outer-tube fully down and adjust the oil level (airchamber) with T137S.



Pull the piston-rod out and assemble the spring.



Pull the spring downwards and place open-end spanner 22 on the hydraulic stop.



Replace first the steel washer on the spring, then the preload spacer(s).



Screw handtight the screw-cap on the piston-rod.



Screw down the screw-cap, till the hydr. stop is against the screw-cap and tighten it to a torque of 25Nm.



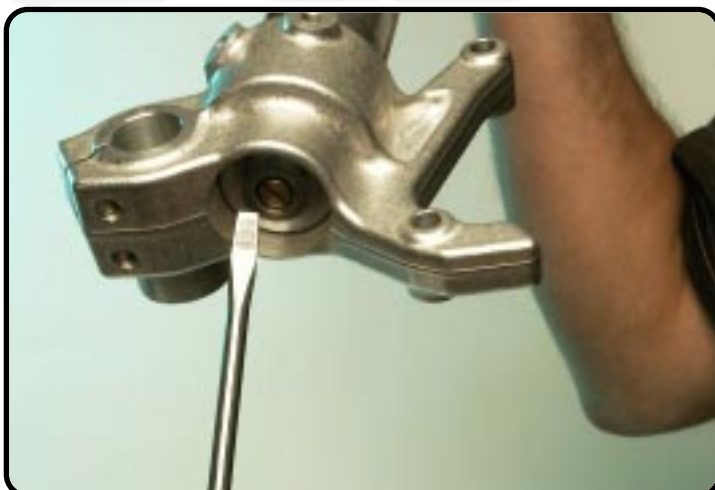
Pull the spring downwards and remove the spanner.



Tighten the screw-cap with T103.



Position rebound!



Position compression!
And replace the rubber cap.

Product

Exploded View

Disassembly & Assembling



Shock absorber

5018 PDS 2003

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Disassembly MCC	33
Assembling MCC	39
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Disassembly adaptor DU-bush	63
Assembling adaptor DU-bush	67
Assembling piston-rod side	70
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On pressure with nitrogen	92
Mounting spring	95
Adjustment	98



Introduction

General notice

Pay attention to the following notes, when you are working with WP suspension products as described in this workshop manual:

Always use clean and professional tools.

Regular you need next to the general equipment, the special tools of WP Suspension.

These tools with a unique "T" number (available at WP Suspension) protect you from damaging the parts.

Always use aluminium protector-plates, when clamping our products or parts in the vice.

Always replace damaged or worn parts.

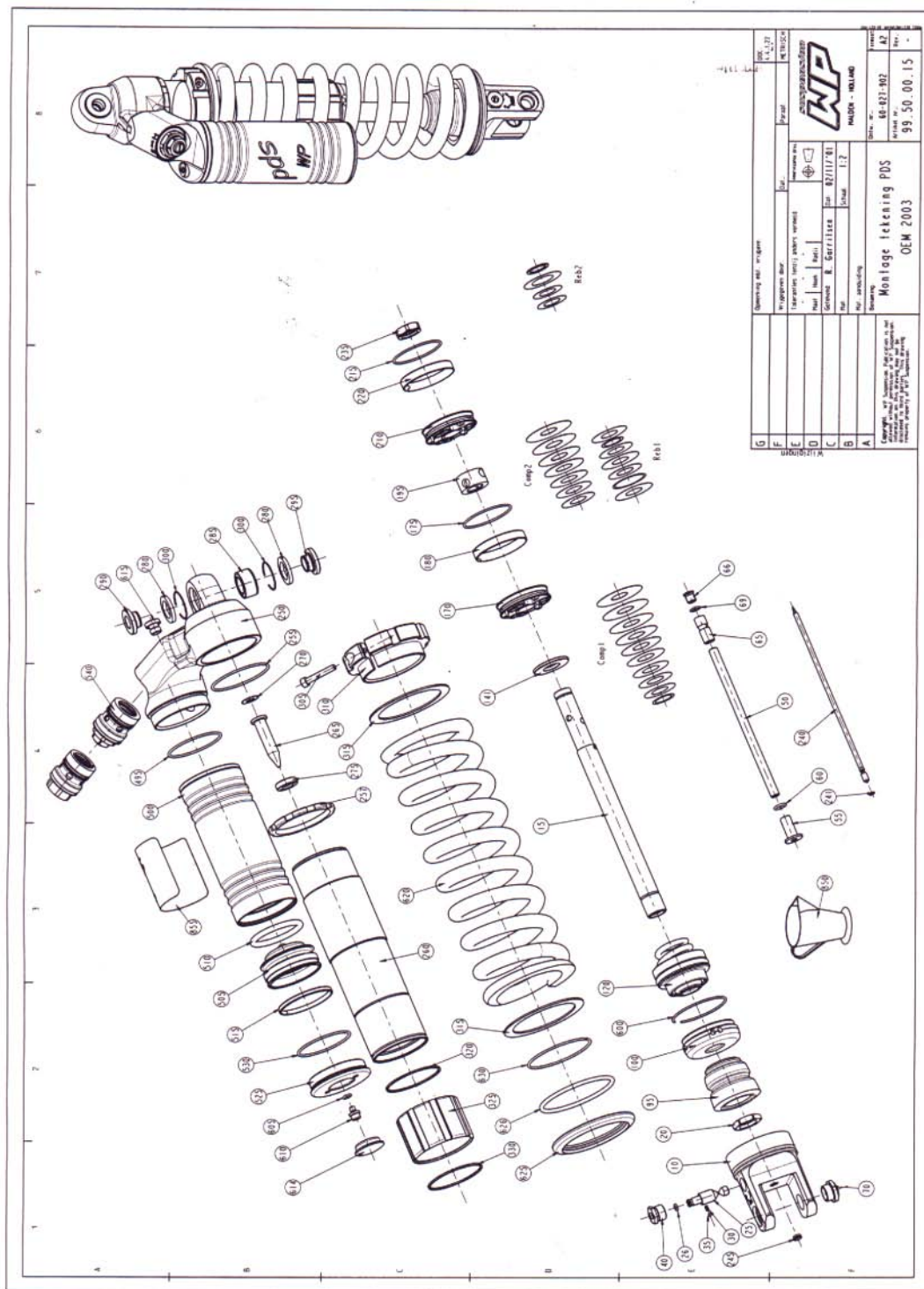
Clean all parts before assembling.

Caution:

Many times it is necessary to assemble parts with T131, T132 and T163.

These parts must dry for at least four hours!!

Exploded view



Disassembly Shock absorber



Take note of the rebound (REB) position. Fully closed is turning the adjustment screw (“+”) clockwise.



MCC

MCC = Mono Compression Control

Take note of the compression (COM) position.

Fully closed is turning the adjustment screw (“+”) clockwise.



DCC

DCC = Dual Compression Control

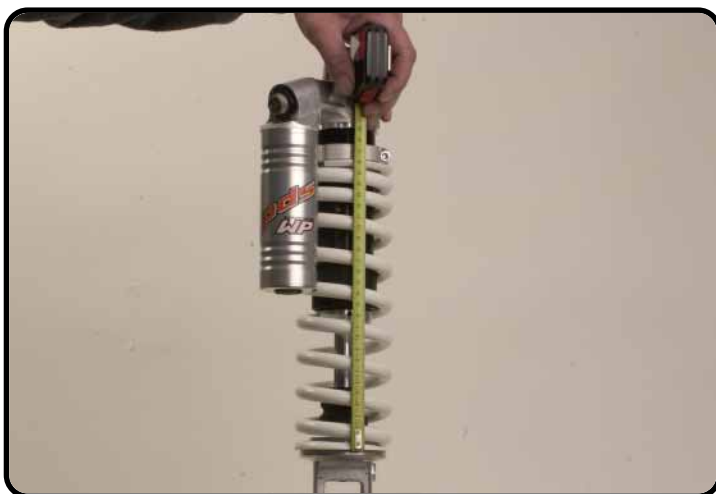
Take note of the compression Low-Speed position.

Fully closed is turning the adjustment screw clockwise.



DCC

Take note of the compression
High-Speed position.
Fully closed is turning the hexagonal (size
17) screw clockwise.



Measure the length of the spring.
Spring preload.



Unscrew the Allen bolt (size 4).



Release the spring preload with open spanner T106.



Screw the screw retainer against the lock retainer.



Disassemble the spring retainer and springing.



Remove the washer.



Remove the spring.
Pay attention to the assembling
direction!!!



Remove the second washer.



Spring with washers, spring retainer and springring.



Disassemble the rubber cap.



Unscrew slowly the nitrogen plug (size 4) to release the pressure.



Nitrogen plug with O-ring.



Tap the cap from the tube.



1. Place disassembling bush T1216 on the adaptor DU-bush.



2.



Push the adaptor DU-bush downwards.



Disassemble the springing out of the tube.



Springing.



Pull carefully but firmly the piston-rod "complete" out of the tube.



Push with depth-stop T107S the separation piston downwards.

Disassembly tube-side

Drain the oil out the tube.



Clamp the tube side in the vice.



Remove the springring out of the groove and slide it a little bit downwards.

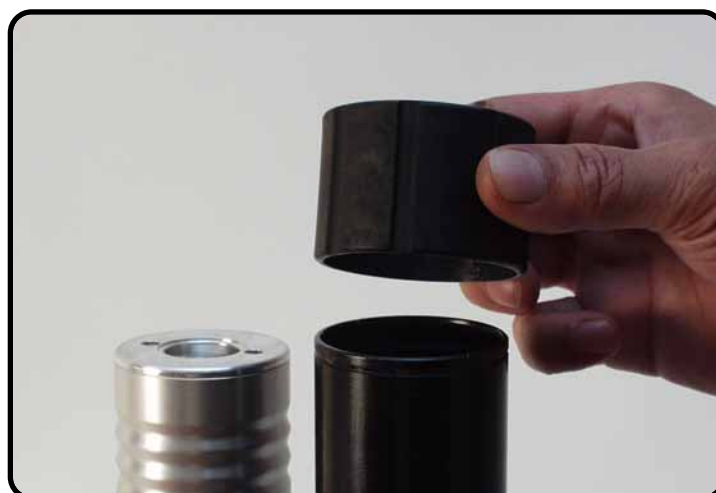




Slide the guiding bush downwards.



Remove the upper springing.



Remove the guiding bush.
Pay attention to the assembling
direction!!!



Remove the springring.



Spring guiding bush with the two springrings.



Turn the screw-retainer of the tube.



Screw-retainer with the Allen bolt.



Unscrew the screw-cap of the MCC
(size 24)
(DCC also size 24)



Remove the screw-cap.



Remove the washer inside the screw-
cap, or on top of the spring inside the
bottom.



Remove the spring.



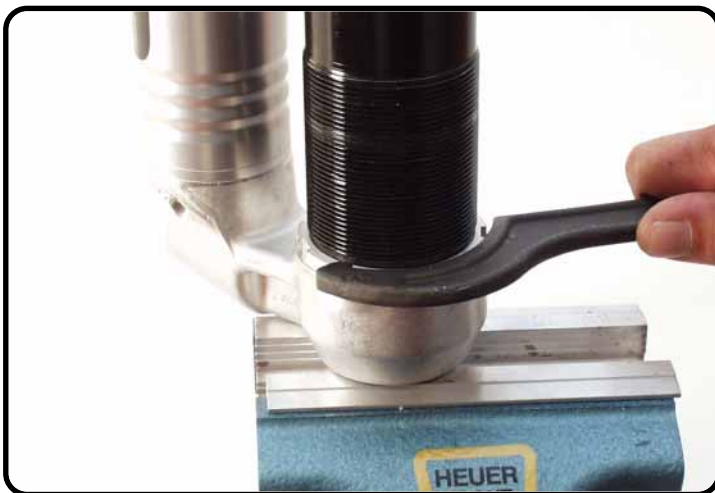
Pull the damping holder "cpl" out of the bottom.



Srew-cap with adjustment needle, spring and the MCC damping holder "cpl".



Heat the lock retainer.



Unscrew the lock retainer with open spanner T1233.



Screw the lock retainer of the bottom.



Heat the bottom near the tube.



Use slide-spanner T146 with bush T1201.



Unscrew the tube.



Screw the tube out of the bottom.



Screw the lock retainer of the tube.



Tube with lock retainer.



Disassemble the O-ring out of the groove inside the bottom.



Place dis- / assembling tool T145S on top of the screw-cap



Place pin spanner T125S onto T145S.



Heat the reservoir near the bottom.



Unscrew the screw-cap.



Turn the reservoir from the bottom.



Remove the O-ring.



Bottom "cpl" with both O-rings.

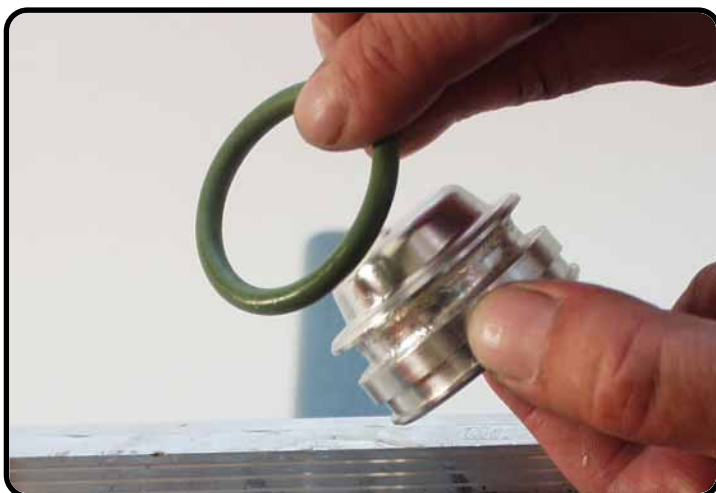


Pay attention to the assembling direction!!!

Push the separation piston out of the reservoir.



Separation piston.



Disassemble the O-ring.



Separation piston, piston ring and O-ring.



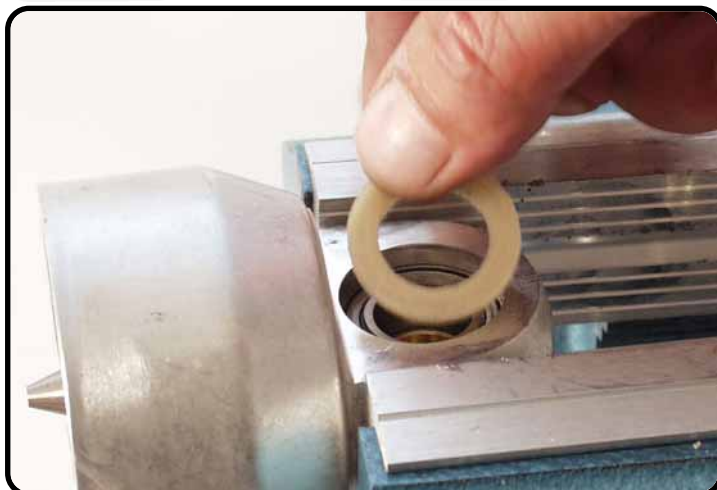
Clamp the bottom in the vice.



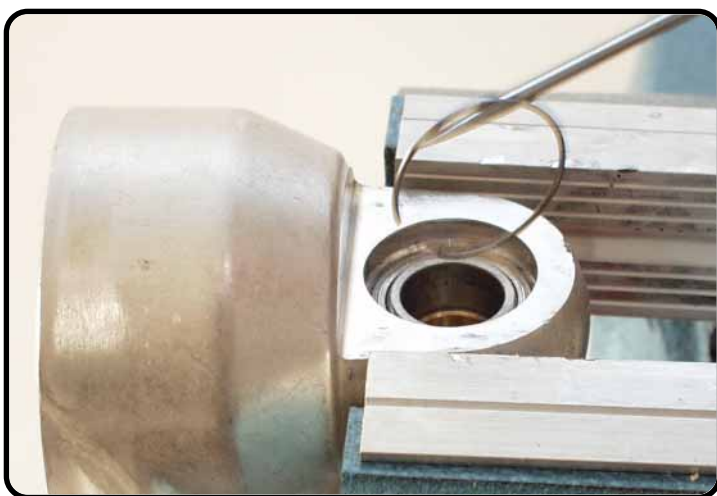
Use disassembling tool T120 for disassembling the adaptor bushes.



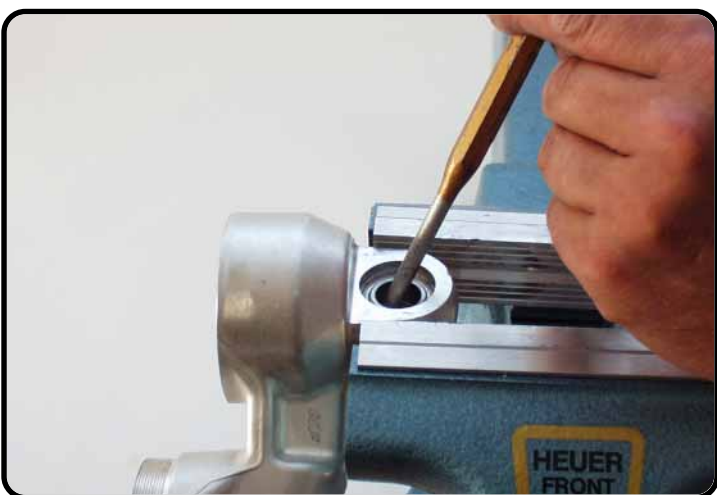
Tap the adaptor bush out of the heim-joint.



Remove the seal.



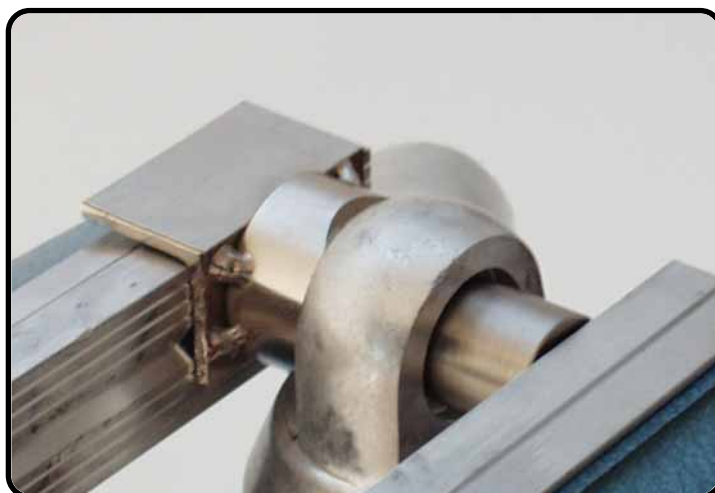
Disassemble the springing.



Tap the other adaptor bush out of the heim-joint.



Use Dis- / assembling tool T1207S for disassembling the heim-joint.



Press the heim-joint out of the bottom at the side where the springing is removed.



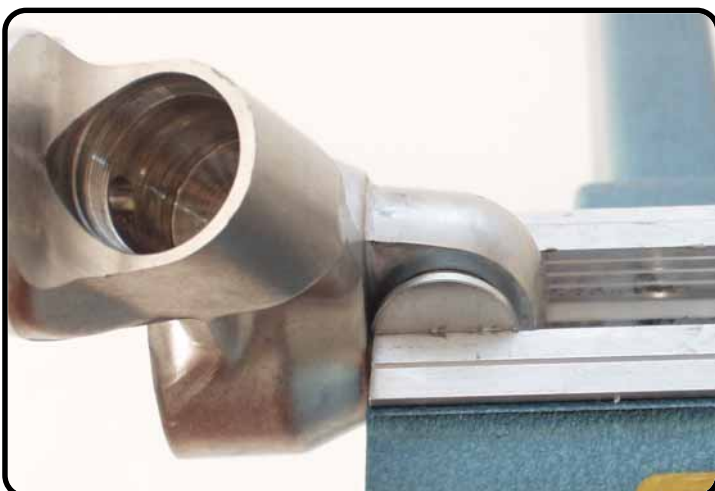
Adaptor bushes, seals, springrings and heim-joint.



Replace one springing.



Assemble the heim-joint with the bevelled edge into the direction of the bottom with assembling tool T1206.



Press the heim-joint into the bottom with support of the vice.



Press with T1207(A) the heim-joint against the springring.



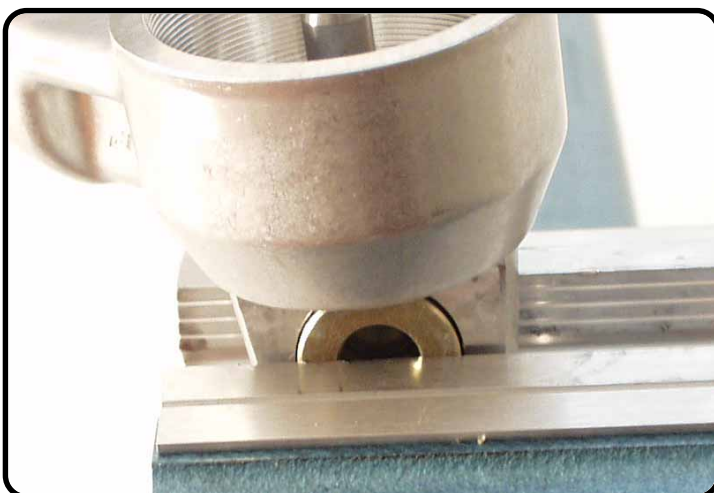
Assemble the springring into the groove.



Replace the seals.



1. Assemble the adaptor bushes with support of T1206.



2.

Disassembly MCC

There is a separated workshop manual for the DCC.

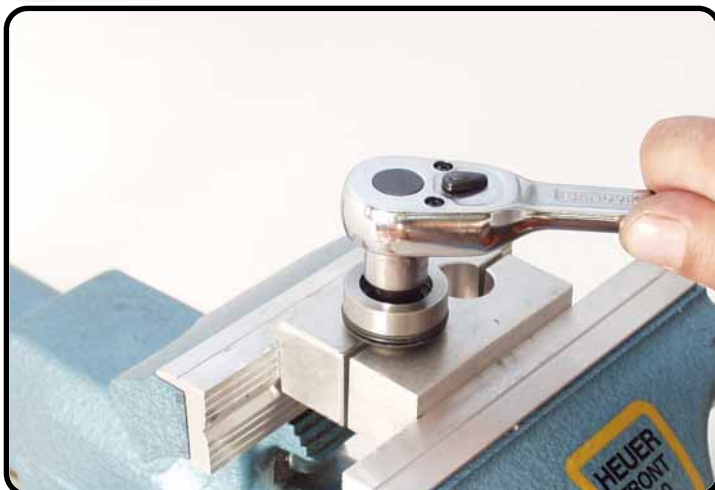
Damping holder MCC.



Remove the disk.
Pay attention to the assembling
direction!!!



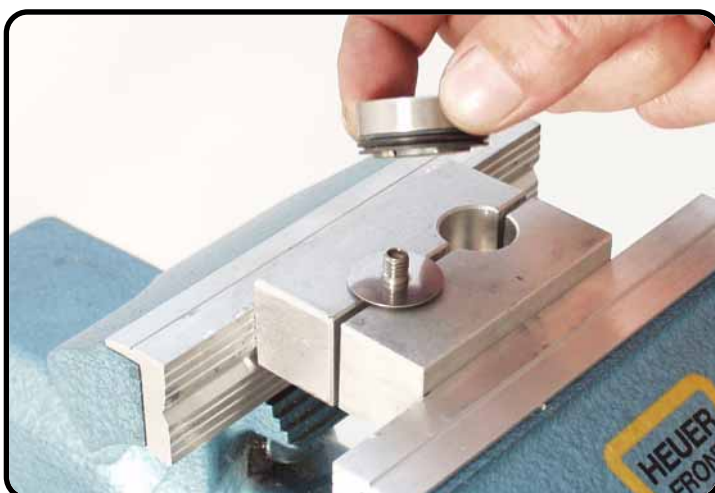
Clamp the damping holder with
clamping block T1202S. **Not too tight!**



Unscrew the nut (size 10).



Turn the nut of.



Remove the piston with check-valve.



Piston with the check-valve side.



Compression side.



Damping holder with shims (setting).



Remove the shims of the damping holder.
Pay attention to the assembling order and
direction!!!



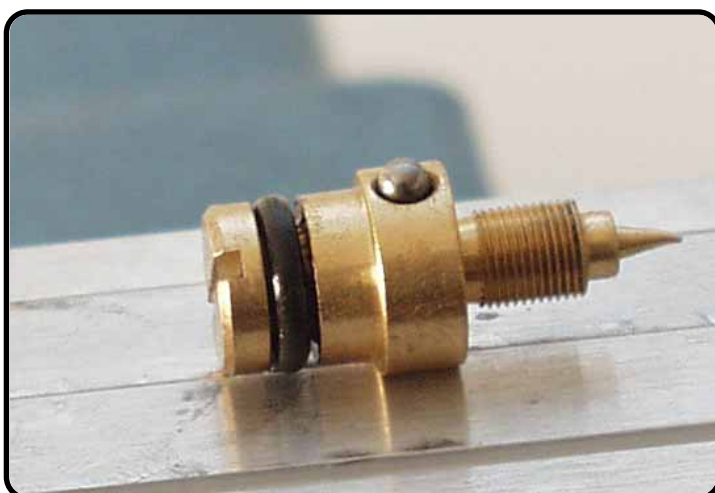
- Nut M6
- piston with check-valve
- setting (shims)
- damping holder
- disk.



Remove the O-ring of the screw-cap.



Turn clockwise the adjustment needle out of the screw-cap.

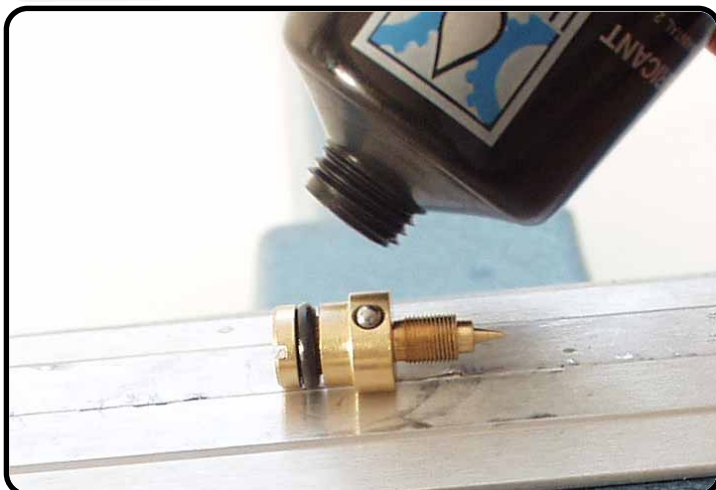


Adjustment needle "complete".

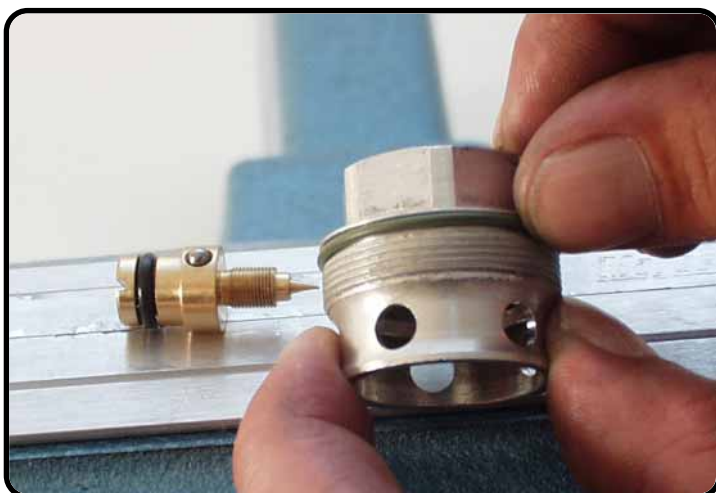


- Steel ball
- spring
- adjustment needle with O-ring
- screw-cap
- O-ring

Assembling MCC



Assemble the spring and steel ball, and grease, also the O-ring, these with water proof grease T159.



Assemble the O-ring.



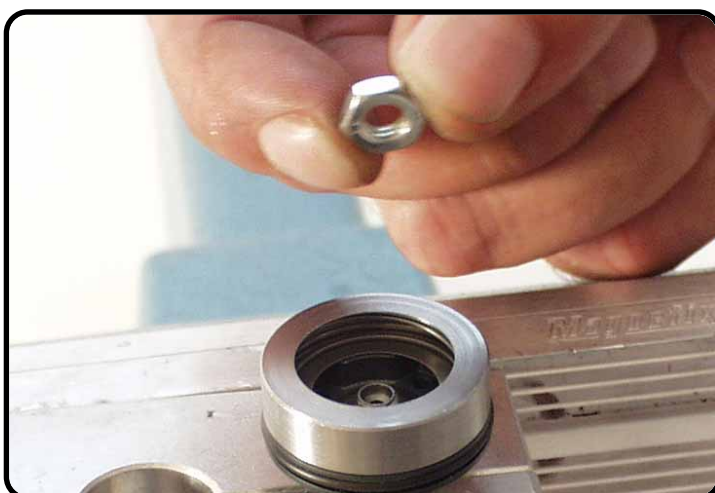
Assemble the needle.



Turn the needle fully open.



Replace the setting and piston with the check-valve



Wet the thread of the nut with Loctite 2701 (T132) and turn the nut on the holder.



Tighten the nut to a torque of 6Nm.



Replace the disk.

Assembling tube side

Assemble the O-ring on the bottom.



Assemble the O-ring inside the bottom.



Grease the O-ring groove of the separation piston with O-ring grease T158.

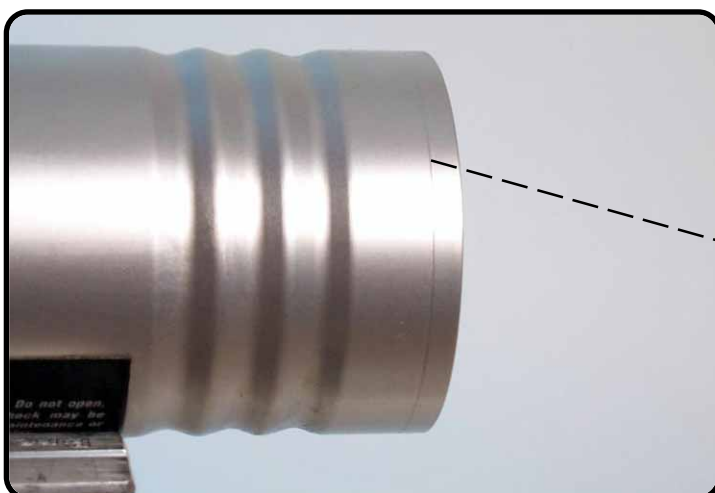




Assemble the O-ring.



Grease the O-ring with T158.



Pay attention to the groove of the nitrogen reservoir.

"groove".



1. Assemble the separation piston and piston ring with the hollow surface into the reservoir at the groove side.



2.



Push the separation piston into the reservoir.



Wet the thread of the bottom with T132.



Wet the thread of the reservoir with T132 on both sides.



Wet the thread of the screw-cap.



Turn the reservoir with screw-cap on the bottom.



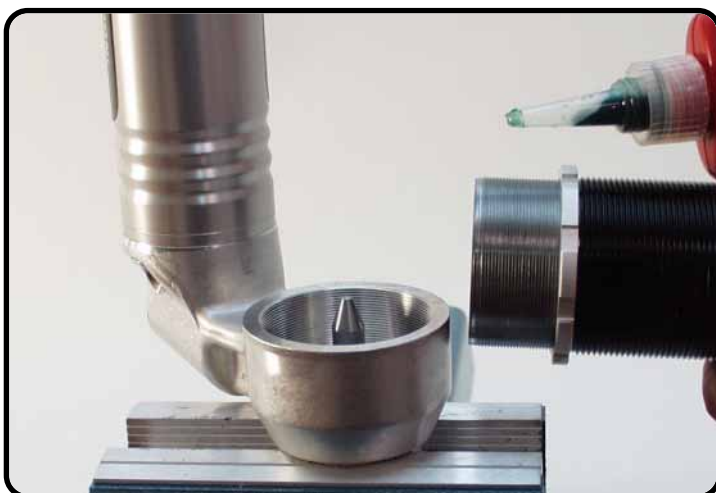
Tighten the reservoir with T125S and T145S.



Wet the thread inside the bottom with T132.



Turn the lock retainer as far as possible onto the tube.



Wet the thread of the tube with T132.



Turn the tube into the bottom.



Tighten the tube with T146 and T1201.



Screw the lock retainer against the bottom and tighten it with T1233.



Turn the screw spring retainer onto the tube and...



...completely downwards.



Assemble the springing passed the groove of the tube.



Slide the spring guide onto the tube.



Assemble the first springring into the groove.



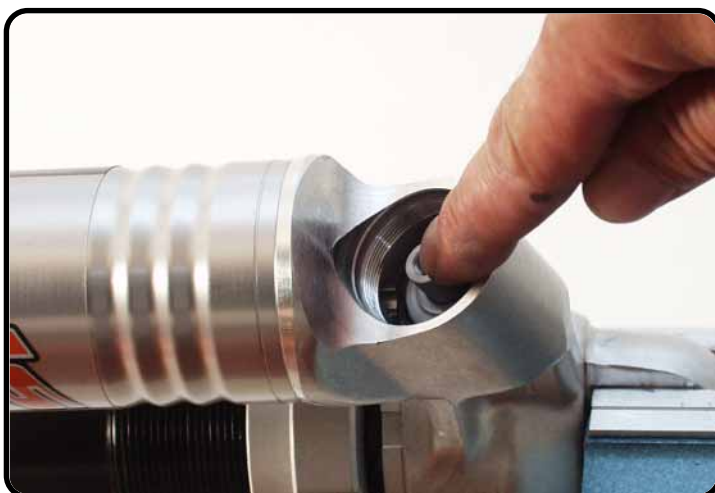
Slide the guiding bush over the springring.



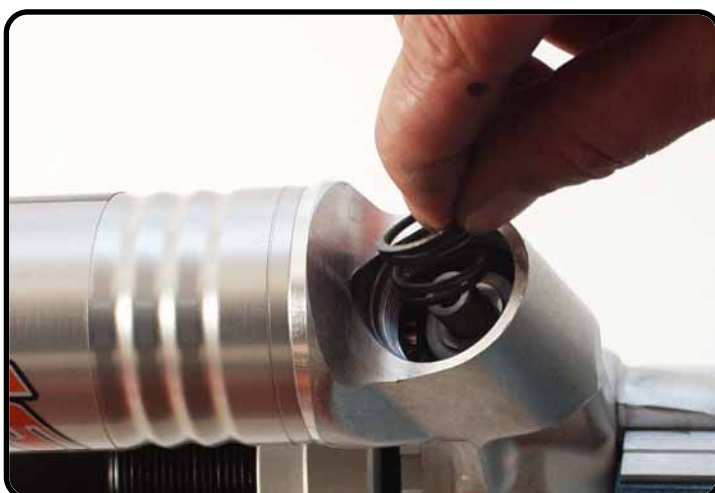
Assemble the second springring.



Wet the O-ring of the piston MCC with T158.



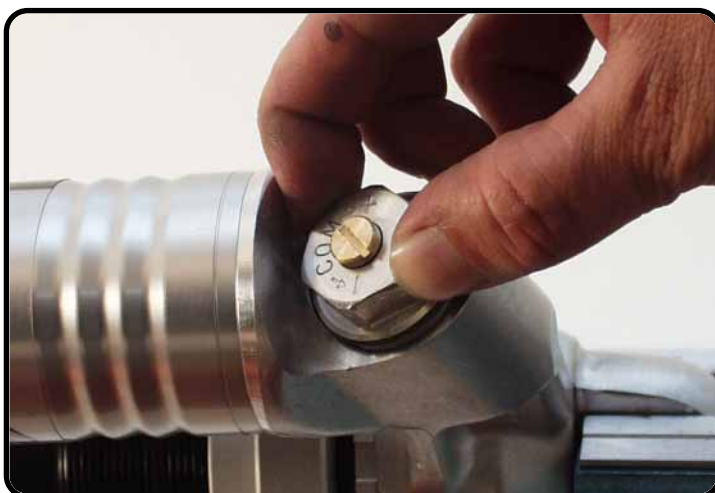
Assemble the damping holder MCC "cpl" into the housing of the bottom.



Assemble the spring.



Place the ring into the screw-cap.



Turn the screw-cap into the bottom.



Tighten the screw-cap.

Disassembly piston-rod side

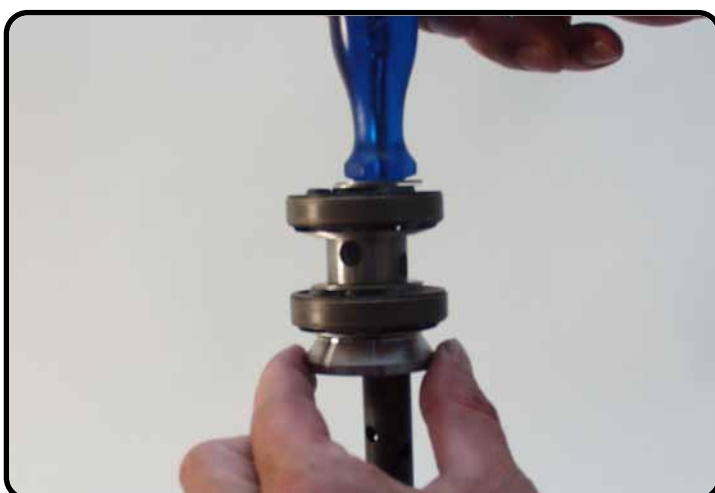
Clamp the piston-rod “cpl” in the vice.



Unscrew the nut (size 22)



Turn off the nut.



Place a screwdriver on top of the piston-rod and lift the entire assembly onto the screwdriver.



- Rebound bush plane
- compression setting 1 (shims)
- piston 1
- rebound setting 1 (shims)
- intermediate bush
- compression setting 2 (shims)
- piston 2
- rebound setting 2 (shims)
- piston-rod nut.



Remove the adaptor DU-bush.



Remove the cap.



Remove the bump rubber.



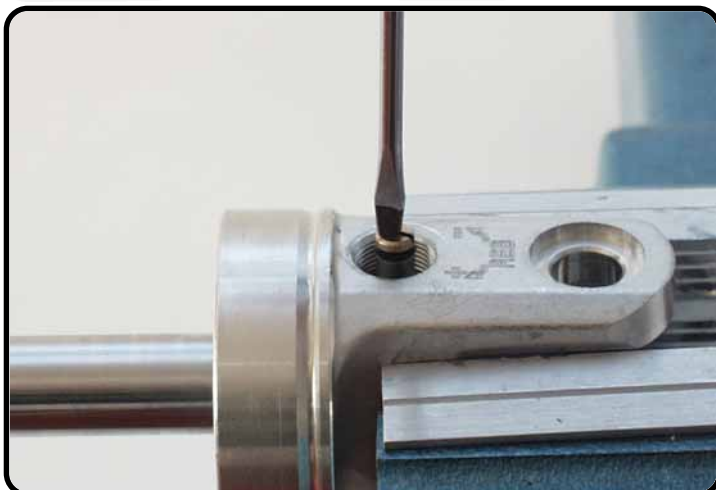
Clamp the mounting-fork in the vice.



Unscrew the screw-cap of the rebound adjustment (size 15).



Turn the screw-cap out of the mounting-fork.



1. Turn the rebound adjustment needle anti clockwise out of the mounting-fork.



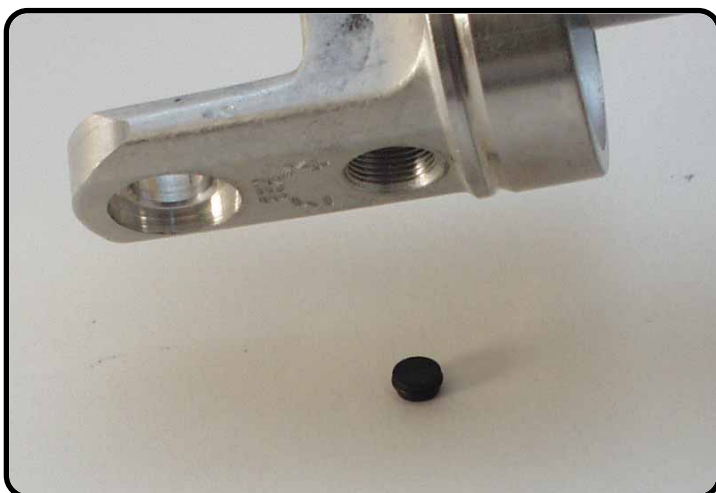
2.



Rebound adjustment needle with the screw-cap.



1. Push the rubber plug out of the mounting-fork.



2.



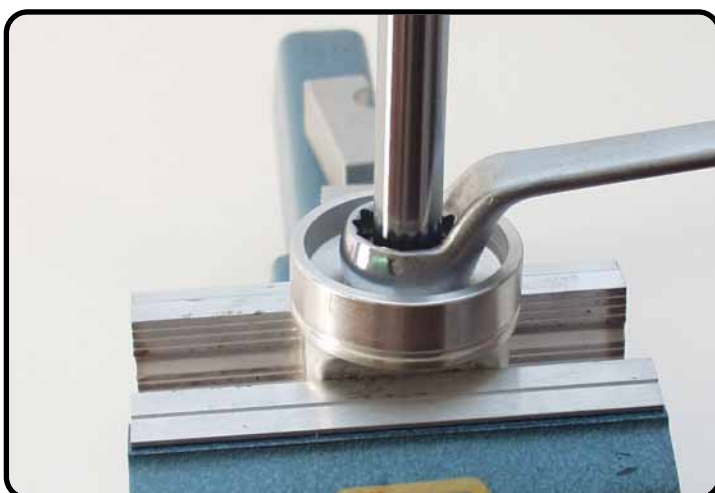
Push with an pin (d2) on top of the piston-rod the rebound needle out of the piston-rod.



Take the rebound needle out.



Rebound needle.



Clamp the mounting-fork in the vice and unscrew the locking nut (size 24).



Clamp the piston-rod in clamping block T1202S.



Heat de mounting-fork.



Unscrew the mounting-fork.



Turn the mounting-fork of the piston-rod.



Turn the nut of the piston-rod.



Push with een Allenkey (size 5) the rebound tube out of the piston-rod.



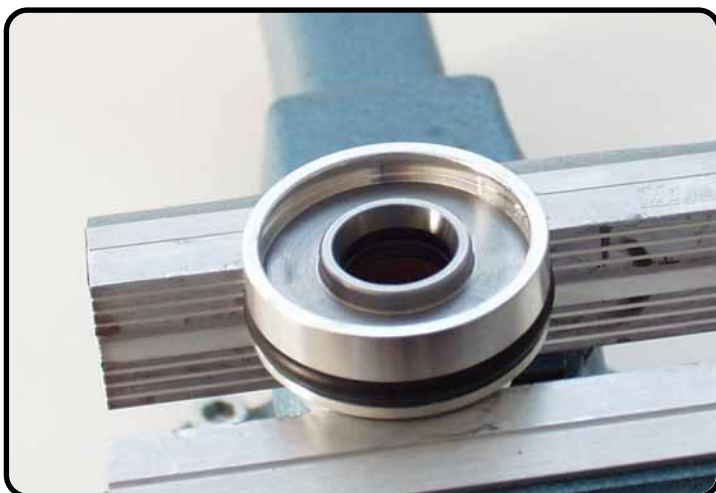
Piston-rod and rebound tube "cpl".

Disassembly adaptor DU-bush

Adaptor DU-bush.



1. Lift the rebound spring out of the adaptor.



2.



Remove the steel washer.
Pay attention to the back-up ring in the washer.



Remove the quad ring.



Remove the second back-up ring.



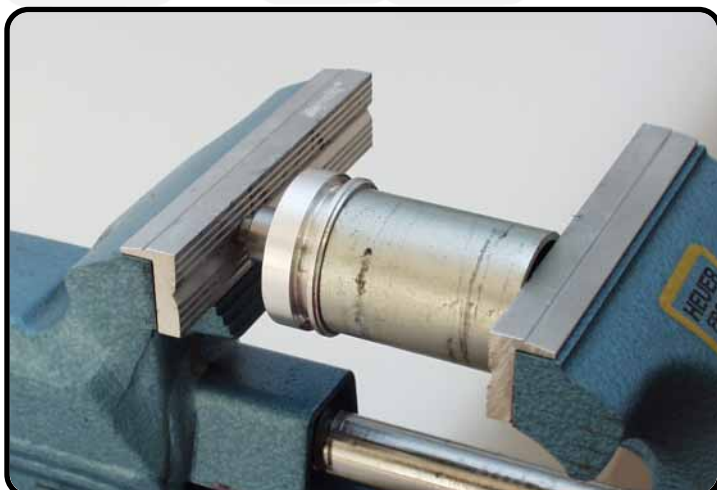
Lift the dirt scraper out of the adaptor.



Disassemble the O-ring.

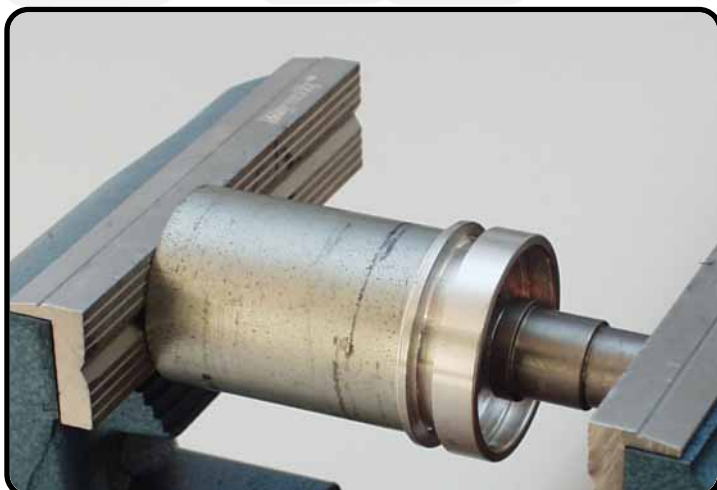


Dis- / assembling tool T1504, adaptor and support bush T1209.

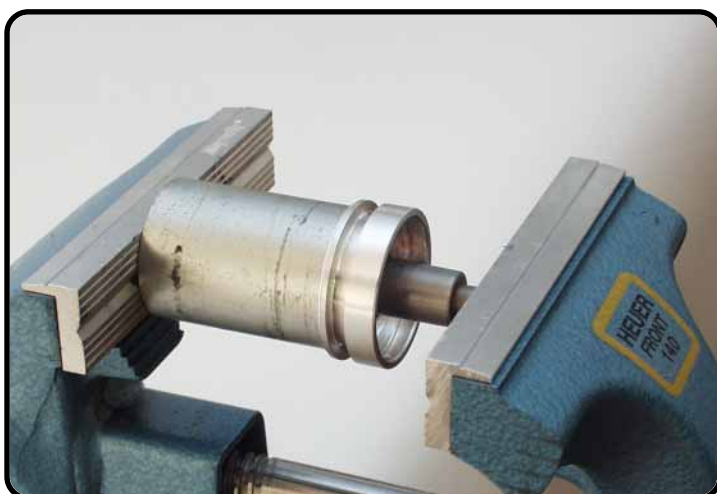


Press the DU-bush out of the adaptor.

Assembling adaptor DU-bush

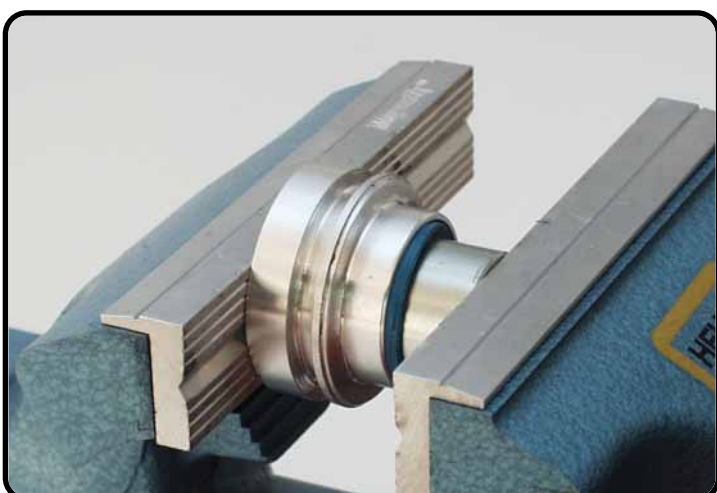


Press the DU-bush into the adaptor with T1504 and T1209.

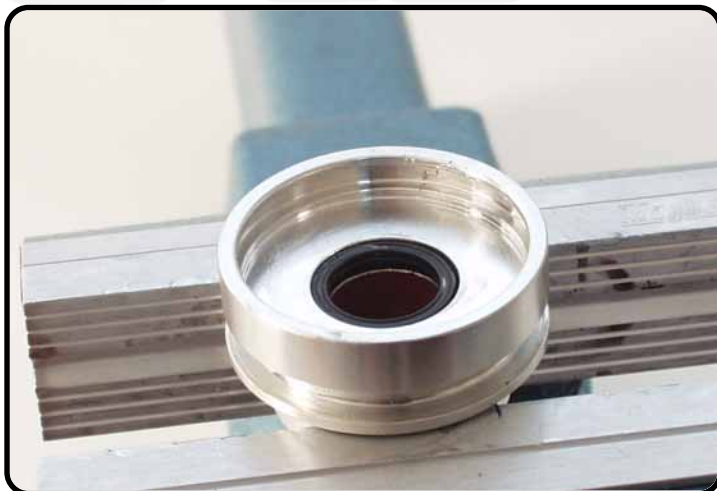


Calibrate the DU-bush with the calibration thorn T1205.

Important: wet the thorn with oil before the calibration.



Press the dirt scraper into the adaptor with assembling bush T1204.



Assemble the first the back-up ring and then the quad ring into the adaptor.



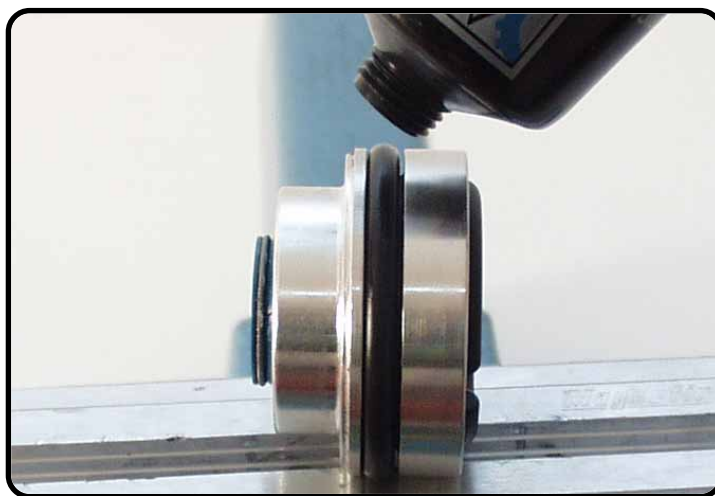
Replace the steel disk with the back-up ring.



Assemble the rebound spring with support of T1209.

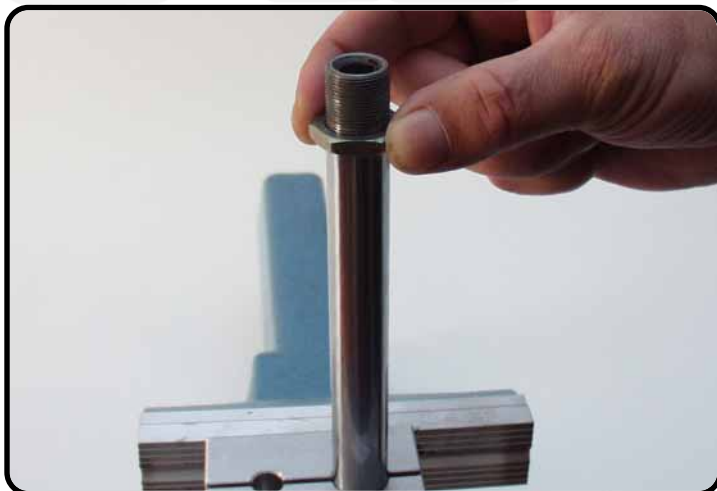


Assemble the O-ring.



Grease the O-ring with T158.

Assembling piston-rod side



Turn the lock nut on the piston-rod.



Grease the O-ring of the rebound tube with T158.



Assemble the tube into the piston-rod.



Wet the thread of the piston-rod with T132.



Turn the mounting-fork on the piston-rod.



Tighten the mounting-fork.



Turn the lock nut against the mounting-fork.



Tighten the nut.



1. Place assembling tool T1215 on top of the piston-rod.



2.



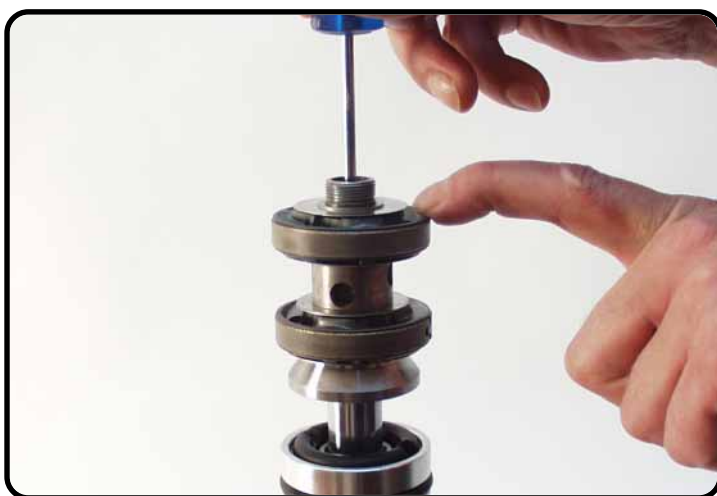
Assemble the bump rubber.



Replace the cap.



Replace carefully the adaptor DU-bush.



Replace the entire damping package.



Pay attention to the first shim, this one must be centered on the ring.



Grease the thread of the piston-rod with a little bit of T158.



Turn the nut on the piston-rod.



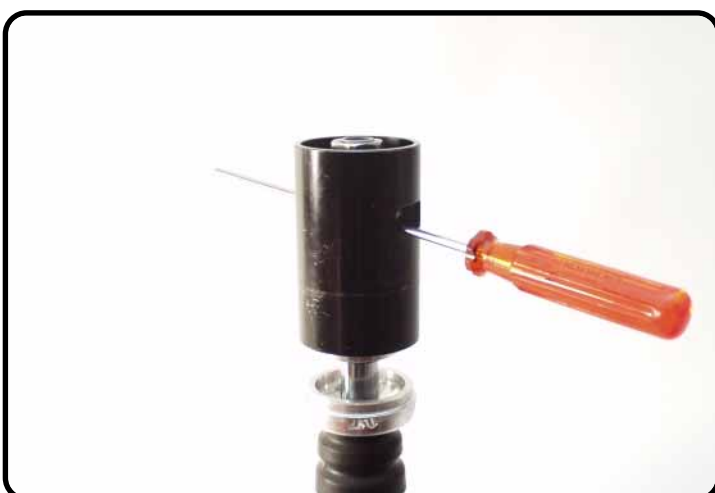
Turn the nut just so far so that the pistons can still be turned.



Place the center sleeve T1214...



...over both pistons and adaptor DU-bush.



Place T107S through T1214, intermediate bush and piston rod.



Tighten the piston-rod nut to a torque of 40Nm.



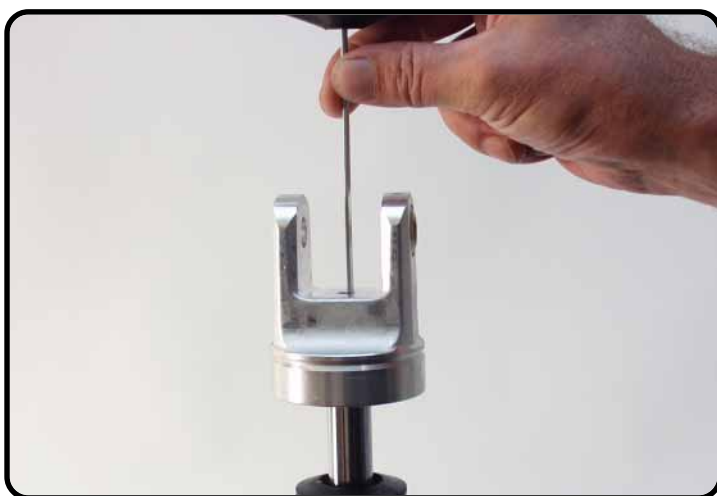
Check if you can lift the shim.



Grease the O-ring of the rebound needle with T158.



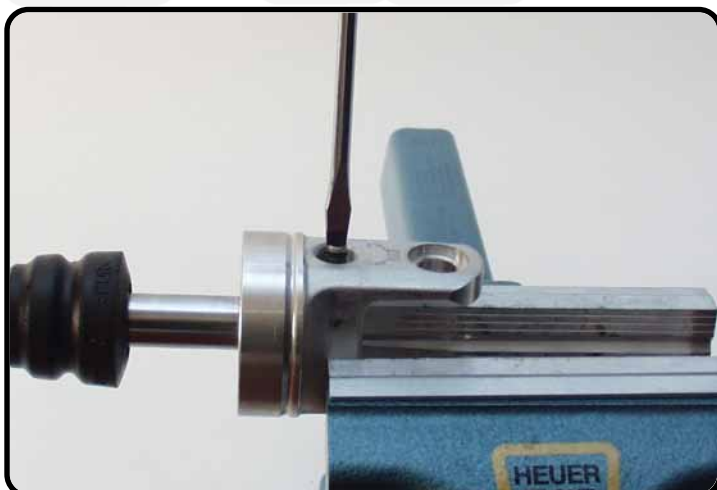
Assemble the needle into the piston-rod.



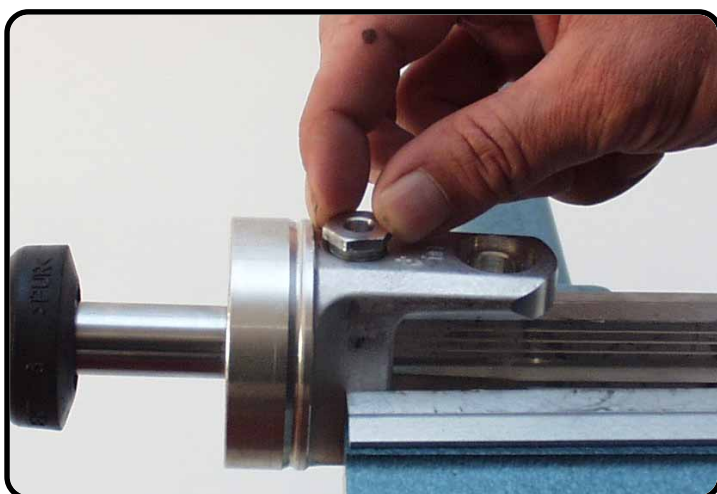
Push the needle further.



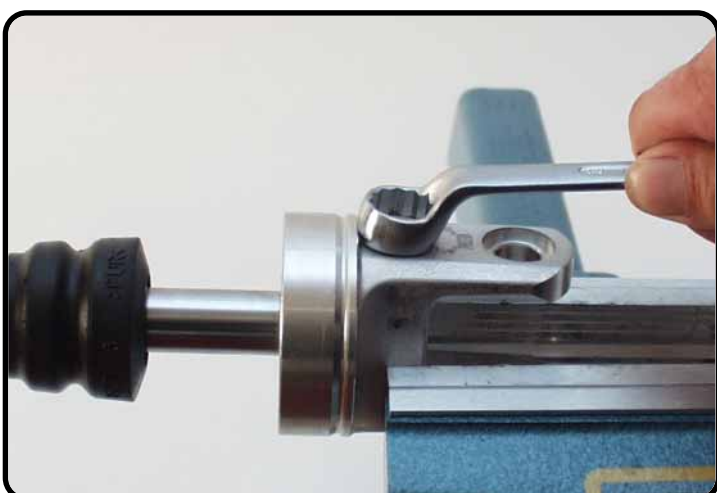
Grease the O-ring and steel ball of the rebound adjustment needle with T159.



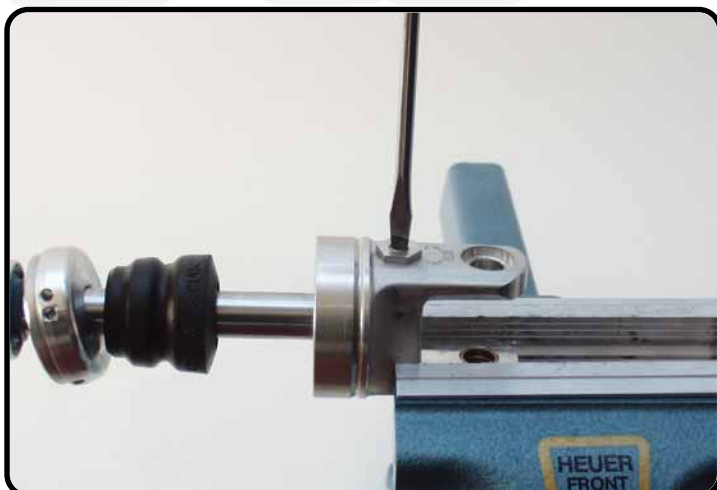
Screw the adjustment needle into the mounting-fork.



Turn the rebound screw-cap into the mounting-fork.



Tighten the screw-cap.



Turn the adjustment completely open.



Push the needle downwards.



Assemble the rubber plug.

Assembling shock absorber



Turn the compression adjustment fully open. (DCC High and Low-speed)



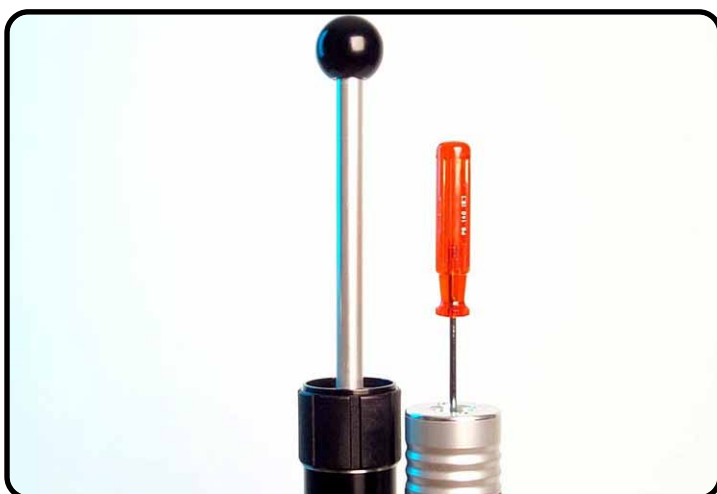
Fill the tube with oil, just under the springing groove inside the tube.



Place plunger T1210S into the tube.



Push the plunger downwards.



Push with T107S the separation piston in the reservoir as far as possible.



Slide the O-ring of T107S against the screw-cap.



Push again with T1210S.



Push with T107S the separation piston...



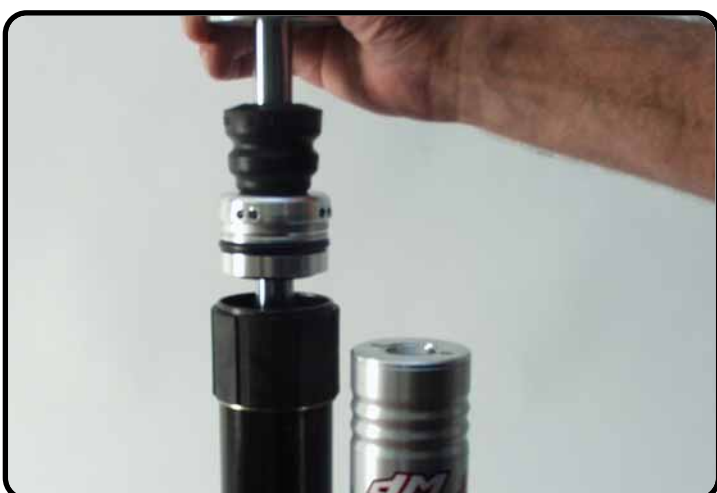
...to the correct position, the O-ring of T107S must have a distance of about 10mm from the screw-cap.



Fill oil till 10mm under the groove.



Close the compression adjustment.
(DCC Low-speed)



Push both pistons under the oil.



Open the compression adjustment.



Push the adaptor DU-bush just under the O-ring groove.



Assemble the springring.



Pull the piston-rod fully out.



Tap the cap into the tube.

Bleeding

Clamp "not too tight" the shock absorber in the vice like picture.



1. Unscrew the screw-cap and remove the entire MCC.



2.





Turn adaptor T1502S of the air release bottle T144S into the MCC (DCC) housing of the bottom.



Ensure that there is sufficient oil in the bottle.



Hold the bottle up so that the oil wil flow into the shock absorber.



Push the piston rod slowly completely inwards.



And out.
Repeat those handlings several times.



Cant the shock absorber several times.



Repeat all the handling till all air is out of the shock absorber.



Push the separation piston to the correct position.



Remove the adaptor.



Assemble the MCC (DCC).

On pressure with nitrogen



Turn the nitrogen plug with O-ring several turns into the screw-cap of the reservoir



Nitrogen charging device T170S.



Place the shock absorber in T170S and open de tap for about 20 seconds.



Close the nitrogen plug.



Close the tap.



Assemble the rubber cap.

Assembling spring

Assemble the washer.



Assemble the spring.





Assemble the second washer.



Assemble the spring retainer.



Assemble the springring.



Adjust the spring...

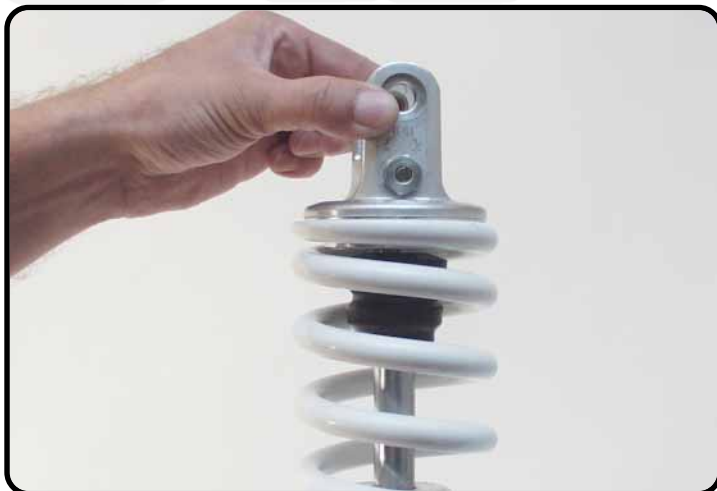


...to the correct preload.



Tighten the bolt to a torque of 5Nm.

Adjustment



Turn the mounting-fork to the correct position.



Compression position (MCC)!



Compression Low-speed position (DCC)!



Compression High-Speed position
(DCC)!



Rebound position!